The Builder.

VOL. XXXVI. No. 1831. SATURDAY, MARCH 9, 1878.

ILLUSTRATIONS.

The Technical High School, Stockholm.—Professor Scholander, Architect 240
Barnsley Mechanics' Institute and Public Hall.—Mr. Hill, Architect 242
The Palace of Justice, Paris.—M. Duc, Architect 243

CONTENTS.

The Work of the Early Stonemason 229
Experiments with Iron and Concrete 231
Professor E. M. Barry's Lectures at the Royal Academy: Italian Renaissance 231
Art Copyright 234
Architecture at the Royal Scottish Academy 236
On Some Points in the Metropolis Local Management Amendment Act, and the Erection of Buildings beyond the General Line of the Street 237
The General Exhibition of Water Colours 238
Notes on Japanese Architecture 238
The Alexandra Palace Building Estate: Important Sale of Building Plots 239
The Wandsworth New Vestry hall 239
The Technical High School, Stockholm 240
Barnsley Mechanics' Institute and Public Hall 242
The Palace of Justice, Paris 245
Art Culture 246
Royal Institute of British Architects 247
The Late Joseph Bonomi 248
The Largest Gasometer in the World 248
The Fall of Buildings in the Haymarket 249
The Soane Museum 251
The Leathersellers' New Livery Hall 251
Royal Albert Hall 251
Dr. Mohr on "The Atmosphere and Our Obelisk" 251
Building on Refuse 251
Waste Condition of Kensington Gardens 251
Builders' Clerks' Benevolent Institution 251
Mycenæ 252
Artesian Wells 252
The Temple Building 252
Trade Matters 252
Work and Wages in the Building Trade 252
Action by a Local Board Surveyor for Slander: Kelly *v.* Fitzpatrick 252
Case under Metropolitan Building Act: Fireproof Separations 252
Lincoln Master Builders' Association 253
Miscellanea 253

The Work of the Early Stonemason.

PROGRESSIVE development of the art of the mason forms the subject of a special chapter in the history of architecture. It is a chapter of no small importance; as its study will be found to extend to the earliest dates of human history, if not into pre-historic times. The facts on which any theory must be constructed are durable realities. And the special value of the investigation consists, not only in the fact that it endeavours to fill up a gap in the history of architecture, both as a science and as an art; but that it further tends to link architectural with ethnological progress, and to exhibit those steps in the history of various races which have been parallel in the order of national development, although not in actual time.

The subject has especial interest, as tending to throw some light on the noble pre-historic relics of our own island, as to which there is so entire a break with regard to any traditions of their origin. We do not forget the efforts that have been made to bring down this origin to the recent date of the Roman occupation of Britain. Without, at the moment, insisting on the weighty arguments opposed to this view, for some of which we may refer to our own columns, we think that it cannot be denied that to trace the development of the art of the stone-cutter is a method of research which cannot fail to throw some light on the question.

Masonry, as the term is now ordinarily employed, may be taken implicitly to include the idea of stonecutting, as well as that of the use of cement, or some artificial method of joining stones solidly together into a mass. But the definition given in the last edition of Johnson's Dictionary is "craft or performance of a mason." And a mason is simply defined as a "builder in stone." These terms cannot be bettered; for they include not only the most finished effort of a perfected art, but the rudest steps of its commencement. Such was the work to which we recently called attention at Tiryns, where vast unshapen stones are piled and fitted into walls, "with only occasional, and apparently later, marks of the tool."

It has, perhaps, escaped attention hitherto, that between the first stage of Cyclopean, or primitive stonework, and the second stage, in which, while the idea of the course of masonry is undeveloped, the sides of the several stones have been reduced to plane, though rarely vertical, joints, has intervened a step in human progress which is not due directly to the mason. We are apt to look at the succession in question as if it were the simple development of masonic skill. But we have no reason for assuming that the builder of Tiryns was unaware that it would have been better to dress his joints than to pile stone upon stone, fitted as best he could. Something was required beyond the wish to make the strongest wall possible. That something was a tool that would cut stone.

As to this, it is perhaps safer to put our views in a tentative form than to attempt to speak with a preciseness as yet unjustified. What was the first tool of the stone-cutter? How far was it possible to cut stone with stone tools; to dress joints by the use of axes of obsidian, jade, or any hard stone? The subject is worth a little experimental research. Supposing it to be shown that such a commencement of stone-cutting was a possible step in the art of the mason, we think that a certain distinction may by this means possibly be pointed out in the examination of ancient masonry. For while a stone axe might, we apprehend, occasionally be used, especially in the case of tufa, and of not a few descriptions of less compact rock, we are not prepared to admit the applicability of a chisel made of stone. If this be so, we shall find in the transition from axe-dressed to chisel-dressed stone a note of time which indicates at what period in his progress the mason was first indebted to the contemporary skill of other artisans for metal tools.

This brings us to another question, of no small importance, if thoroughly solved. To what extent was it possible to cut stone with a chisel before the introduction of iron? We are aware from literary testimony that the manufacture of iron dates much later than that of bronze. Not that the subject has been exhaustively treated; but still iron, when it first came into use, appears to have been the rarer and more highly valued metal. In Homeric times (whenever they date), bronze or brass was used not only for defensive, but for offensive arms. The earliest date to which we can with certainty carry back the proof of the use of iron is 5,400 years ago. In the Pyramid of Souphis (or Cheops) iron has been found in such a position as to leave no doubt that it had been in the possession of the builders of the pyramid, under the fourth dynasty of Memphite kings of Egypt. This significant discovery may perhaps throw light on another question of extreme importance as regards the history of masonry. That is,—how were the hieroglyphics cut? We shall be indebted to those learned men who are doing so much to unveil the written mysteries of Egyptian history for any definite statement of the date of the most ancient incised hieroglyphics; and also, as to the fact whether any appreciable differences in the style or mode of cutting is to be detected, and referred to known dates. The general impression produced by a study of the inscribed statues and *stelæ* at the Turin Museum, at the British Museum, and elsewhere, is, that as far back as Egyptian relics exist, the hieroglyphics were cut in basalt, green-stone, granite, or other hard stones, with a depth and a precision which are those of the gem-cutter rather than of the stone-cutter. As iron was known in the time of the fourth dynasty, steel might have been also known; or the use of iron of meteoric origin, or of extreme purity, may have given to the early inscribers the means of effecting their work. On the other hand, there is the possibility that some kind of drill was used for the inscriptions; and if corundum powder was employed, a soft iron or copper drill might have been sufficient for the purpose of the workman. Adamantine corundum, an excessively hard spar, occurs among the granite and mica schists of Egypt. Granular corundum, or emery powder, is found in Greece, and may very probably have been known to the early Egyptian artists. At all events, this part of the subject will repay research. At present we will only attempt to lay down the principle that the mode of cutting stone that was employed at any particular period, affords an index to the knowledge and use of metal tools possessed by the masons of that time and country.

In Mycenæ we have instances of the cutting of stones of the magnificent dimensions of nearly 30 ft. by 18 ft. by 4 ft. At Avebury we have stones, presumably once cut, of almost equal size. In the Great Pyramid we have examples of enormous stones cut so that the joints are impenetrable to a knifeblade. In the walls of the Haram or Temple enclosure of Jerusalem we have stones of the same giant family, some of which are not older than the time of Herod the Great, or the commencement of the Christian era. We have thus a range of certainly 3,500 years, during which the masons of Greece, of Egypt, of Syria, and possibly those of Wiltshire, cut, dressed, and set enormous stones. To how much earlier a date we may hereafter be able to push back the commencement of the art of stonecutting, which we think may be fairly associated with the presence of polygonal cut stones in a wall, we cannot attempt even to guess; but we have, at all events, something like a means of measuring the relative advance of various tribes or nations by the comparison of their works. Whether the builder of the Great Pyramid wrought 1,000 or more years before or after the builder of the walls of Tiryns, the former was certainly a much more educated and experienced mason than the latter. So again, by comparison of their works, we should conclude that the masons who built Stonehenge and Avebury were much earlier, dating by their professional knowledge, than those who built the Pyramid. Civilisation, we know, has often been narrowly localised. A high state of industrial perfection in one country may co-exist with a low condition in another at no very remote distance. If this were not the case we should have something approaching to the nature of proof that Stonehenge is older that the Great Pyramid. We are unaware of any good data for fixing the earliest possible period of the erec-

tion of the English megalithic temples, though reasons have been adduced in this journal for the opinion that marked geological changes have affected this part of Europe since those noble structures were completed.

Another very ancient evidence of the art of the stone-cutter is to be found in excavations of rock. Of these the examples in Egypt, in Eastern Syria, in Western India, and elsewhere, are not unfamiliar to the architect. Very generally they give signs of being of much later date than the megalithic buildings of which we have been speaking. A trabeate form of architecture has been imitated, in numerous instances, by men who wrought in the living rock. But there are two groups of stonework *in situ* as to which we are as yet only in course of receiving definite information. These are the military rock defences of Palestine, and the rock-cut tombs which abound in the Holy Land. The old sites of the Jewish cities are for the most part covered with mounds of rubbish, in which it is utterly vain to expect such surprising relics to be hidden as have rewarded the explorers of Mesopotamia. But very often the modern towns which bear the names, and no doubt stand on the sites, of Biblical and pre-Biblical cities, are surrounded by a scarp of rock artificially cut. "The most wonderful of these scarps," writes Lieutenant Conder, R.E., in the Quarterly Statement of the Palestine Exploration Fund for January, 1878, "is that at the south-west corner of Jerusalem, where a carefully-worked wall of rock, 50 ft. high, is traced for over 150 yards. Similar scarps, on a smaller scale, are not uncommon throughout the country." The account given in the Book of Samuel, of the capture of Jerusalem by David, 2,900 years ago, gives reason for the belief that the rock scarp was at that time in existence, even if it may have been carried to a greater depth later; as to which, however, there is no evidence.

The same explorer calls attention to another work of the stone cutter in the same country; namely, the excavation of rock-cut reservoirs and cisterns. "Bell-mouthed cisterns occur so constantly near, and in connexion with, Jewish tombs, that it seems natural to ascribe them to Jewish workmen, though they have no marks of date which will fix them so early." It is, however, evident that works of this nature must have been co-eval with the settlement of many parts of the district bordering on the Mediterranean. Those tribes which inhabited watered plains, or dwelt on pervious soils, in which they might find springs, or dig wells, had no need of the services of the quarrymen and the mason in combination. But where the soil is rocky and impervious to water, where the rainfall is unequally distributed throughout the year, and where the temperature renders a certain abundance of water a necessity of life, no permanent habitation of a country can be effected without the construction of cisterns.

Of like nature to the Syrian cisterns are the granaries or treasuries that are sunk in the soft, dry rock so prevalent along the Eastern versant of the Apennines. In the neighbourhood of Foggia, where rich crops of corn are secured in the summer months, the ground is, in some places, honeycombed with bell-shaped or conical excavations, in which corn is stored sometimes for many years. The form of those granaries so closely resembles that of the Etruscan tombs, in which the arch is anticipated by the progressive over-setting of course above course of small bedded and squared masonry,—set, in some tombs that we have opened, without mortar,—that it seems proper to associate the excavating with the building stone-cutters of *Magna Græcia*, and probably of other countries.

With regard to tombs, the explorations of Lieutenant Conder throw light on a very important mark of relative antiquity. Near to every modern village or ancient site of a town in Palestine, usually on some opposite hill, are to be found rock-cut tombs. They are hardly ever found within the ruins. They may be divided into three classes. Of these, the first bear the name of *kokim*, or oven-like tombs. They are formed by cutting small parallel tunnels, each of the dimensions proper to contain a human body, from the sides of a rectangular chamber. The *kokim* vary in number from one or two up to eighteen or twenty; and in size from the length of 3 ft. to that of 7 ft. There is no system of orientation. The entrance-door to the chamber is in the face of the cliff, and the chamber itself is excavated in accordance with the lie of the rock. The chamber may probably be regarded as the original provision for a family tomb; fresh *kokim* being cut from time to time, as wanted, of dimensions not larger than requisite for the sepulture of the individual for whom it was cut.

The proof that this form of tomb is the oldest in the country is definite. The second class of tombs is that containing *loculi*, or side receptacles, parallel with the walls of the chamber, instead of being at right angles to it as in the former class of tombs. The *loculus* arrangement is still adopted in mausoleums in Italy, as for instance, in the Superga, near Turin, where the members of the Royal family of Savoy are laid to rest in parallel niches, something like the berths in a vessel, the faces of which are walled up on the interment being made. That these tombs in Palestine are of later date than the *kokim* is shown by the fact that there are instances in which an outer chamber, containing the former kind of receptacles, leads to an inner chamber,—pierced further in the rock,—containing *loculi*. But no instance has been found in which the order is reversed.

Of the anterior limit of the date of the *kokim* tombs it can only be suggested that it may probably have been as early as the inhabitation of Palestine by a burying, as contrasted with a burning, race. That they were used by the Jews is shown by the description given in the Talmud, and by the occurrence of Hebrew inscriptions, and of a representation of the sacred candelabrum in certain cases. To others a traditional veneration is attached. But the substitution (in part or in whole) of the second for the first method of construction is shown to be older than the Herodian time by the references made by each of the Evangelists to the rolling stone with which the mouth of the tomb in the garden was closed. This arrangement is said by Lieut. Conder to occur almost invariably in the *loculus*, but not in the *kokim* tomb. An inclined groove is cut before the entrance to the chamber, and a cylindrical stone, like a millstone, is placed in the groove. To enter the tomb it is necessary not only to roll the stone up the slope, but to wedge it up, as it would otherwise descend with its own weight, and completely close the entrance.

The tombs belonging to the second group are more ornamented than those of the earlier system. Some of them have façades covered with a rude kind of imitation of Classic mouldings. "There is generally a portico, with a frieze above, supported by pillars cut in the rock, with Ionic or Corinthian capitals. The chamber is sometimes also ornamented within." If the attribution of a well-known tomb at Jerusalem to Helena, Queen of Adiabene, be correct, we have a dated instance of this kind of tomb in the first century of the Christian era, in accordance with the references to the rolling stone made by the Evangelists. The *loculus* tombs occur during the Byzantine period, but are not found in the crusading cemeteries.

The third class of tomb is the rock-sunk tomb, which is a shaft sunk in the rock, with an arched recess on either side, in which two bodies can be deposited. The earliest examples found by Lieut. Conder are connected with Byzantine monasteries. No indication has been found of the use of this kind of tomb by the Jews, unless it be taken from the account of the tomb of Lazarus, in the fourth Gospel, which is called a *spelæum*, with a stone that lay on it. The natives of Syria call this third group Frankish tombs.

The only relic of Jewish architecture further mentioned by Lieut. Conder (omitting for the present any question as to the sites of the high sanctuaries at Jerusalem and at Hebron), are the vineyard towers. "These buildings are generally about 15 ft. square outside, and the same in height. The walls are of unhewn blocks, 4 ft. or 5 ft. long; the roof, supported on a buttress, is of slabs 7 ft. or 8 ft. long. These solid and rude buildings occur near rock-cut wine-presses and ancient tombs."

The great works of Herod the Great at Cesarea, Samaria, Ascalon, Antipatris, Jerusalem, and Herodium have almost entirely disappeared. It is only at Jerusalem and Hebron that megalithic masonry, with the draft and dressing of the stones which are peculiar to Palestine, now occurs. The aqueducts attributed to the same period are of small masonry laid in excellent mortar. Exact information as to all these architectural points will be accessible when the memoir, now in course of preparation to accompany the Ordnance map of Palestine, is published. That work will be found to contain a perfect mine of information for the architect. Plans have been made of all ruins of any importance. The size and mode of dressing of the masonry has always been noted, with the character of the mortar, and other particulars. Mouldings of capitals, cornices, and bases have been measured, and sketches made of tracery. Photographs of architectural details have in many instances been taken.

The peculiar drafting of the enormous blocks forming the walls of the High Sanctuary at Jerusalem is known to most of those interested in the subject, from photographs. We must await the early publication of "Tent Work in Palestine," announced by Mr. Bentley, for more full description of this unique, or almost unique, masonry, and for a statement of the evidence as to its anterior and posterior dates. There is also a drafted masonry of the Byzantine epoch, between A.D. 326 and A.D. 636, during which period Palestine was covered with Byzantine monasteries and chapels. Of this there is a dated example in the walls of the fortress built by Justinian round Zeno's Church on Mount Gerizim. The masonry is, however, entirely different from that at Jerusalem. The draft is deeper and broader, irregularly cut, and finished with an entirely different dressing. Semicircular arches accompany this masonry, with narrow keystones, and broad voussoirs at the haunches. This is also the case with the tunnel vaulting of the churches, as in that of St. John at Beit Jibrin. Another peculiarity of this age of building is the use of a large and heavy lintel, generally marked with a cross, and almost invariably present over a doorway; although the weight is very usually taken off by a relieving arch above. In some cases these enormous stones are the only relics that remain to tell of the site of a former building. Sometimes these lintels were inscribed. At Khoreisa the surveying party found one bearing the Greek text, "This is the gate of the Lord."

The crusading epoch in the greater part of Palestine, as far as building is concerned, extends from the building of Toron (now Tibrin) in 1104, to that of the church at Nazareth in 1187. On the coast, however, there are later structures of Christian origin; the restoration of Cesarea dating in 1251. In the Eastern Crusading buildings, one of which is the hospital at Jerusalem, we find heavy mouldings and semicircular arches. In the Convent of St. Marie la Grande the arches are slightly pointed, and there is a dog-tooth moulding resembling those common in English churches. At Samaria the round arch has been used as late as the latter half of the twelfth century. At Beit Jibrin the remains of the Church of St. Gabriel, built about 1134 A.D., have slightly pointed arches, rising from heavy pillars and cornice. Imitations of Corinthian capitals occur in most of the earlier Crusading churches; and from the fact of their exact similarity to one another in the same church it is inferred that they were the work of the twelfth-century masons, and not the spoil of earlier buildings.

Growing later, the architecture becomes more light; beautiful clustered columns replace heavy pillars, and ribbed groining is introduced. The arches are always pointed, with distinct voussoirs. The Corinthian capitals are succeeded by others of an endless variety of form, leaves, varying from smooth to deeply serrated, being the usual ornament.

Diagonal dressing is one characteristic of Crusading work. At least, this mode of finish is not found at an earlier date. It was not always employed, however, by the twelfth-century builders. A rough kind of diagonal dressing is also found on Saracenic work, but it is possible to distinguish the two. The use of the toothed chisel prevailed, as was the case at the same date in France and in England. Masons' marks, including every letter of the alphabet except D, G, Q, and X, also abound in this work, as well as inscriptions. A collection of masons' marks is given in the Memoir. The exterior walls of Crusading fortresses are of massive ashlar. They are almost invariably drafted, with a rustic boss, which projects sometimes a foot from the draft. This work is perfectly distinct from both the Jewish and the Byzantine drafted masonry.

The Saracenic work is known by its small and less finely cut masonry, by the absence of masons' marks, by the pointed arches, and by the low relief of the ornamental designs. There can be no doubt that the publication of the Memoir to the Map of Palestine will be a very valuable contribution to the history of the craft of the mason.

EXPERIMENTS WITH IRON AND CONCRETE.

SOME of those who took part in the first Architectural Conference in 1871 may remember that the subject of fireproof materials and construction was then discussed in a very practical manner, and it was, perhaps, on that occasion that several materials commonly called "fireproof" were first openly discredited in regard to that pretension. On the same occasion, also, a method of construction was advocated as alone deserving to be called really fireproof. Our note at the time (*Builder*, June 3, 1871) records it thus:—

"Mr. Fowler brought forward, also, a specimen of new fire-resisting construction for beams and bearers, manufactured by Messrs. Allen & Sons. This consisted of a cement concrete formed of a small proportion of Portland cement and a considerably larger quantity of breeze (foundry refuse) worked up into the shape of a kind of concrete joist, with a stiffener of thin plate-iron in the centre. From the effect of the concrete in always keeping the plate of iron precisely on edge in the direction of its greatest strength, a very thin piece of iron might be depended upon for giving a great amount of stiffness. Only 10 ft. or 12 ft., however, was named as the maximum bearing for joists of this kind, and as the ends of these must rest on some larger (probably iron) beam, the question of stability of the construction against fire seemed, after all, to turn on the manner in which the main beam behaved."

Remembering, however, our impression at the time as to the really fireproof character of the method of construction referred to, and our doubt as to how far it would be practically taken up(for improvements of this kind are so often just mentioned and then forgotten), it is with some interest that we notice a small, thin, quarto volume, very well illustrated, which shows the results of a systematic examination of and experiment upon this very principle, only carried further and with important additions in regard to detail. The book referred to, which is printed for private circulation,* is by Mr. Thaddeus Hyatt, who has been for more than twenty years engaged in investigating the subject of fireproof flooring. Mr. Hyatt calls attention to the radical error which has long pervaded attempts at fireproof flooring, of leaving the main iron bearers or beams more or less exposed, so that the very main portion of the construction is liable to injury from fire; and it is in consequence of this that firemen have, as he assures us, and as we believe is the case, a dread of so-called fireproof structures more than of those which are not called so. That neither iron nor stone can rank as a fireproof material is indeed becoming a commonplace with constructors now; and it has been laid down by some of those most conversant with the subject practically that no material can be called fire-*proof*, only fire-*resisting*. Mr. Hyatt, however, seems to have actually solved the problem of a fireproof material. The question remains as to its suitability for extensive adaptation from an architectural point of view.

The chief specialities of the method laid down in Mr. Hyatt's pages are threefold: first, the *entire* encasing of the iron which forms the pith of the construction in concrete; both the main beams and the thin slips of iron which take the place of joists being completely imbedded; second, the employment of a new and professedly superior Portland cement, the systematic manufacture of which awaits at present the formation of a company to work it, but which is stated experimentally to be more unaffected by fire than any existing cement; and lastly, and by far the most important point in the book, the discovery that the iron can be used in combination with concrete as a *tie* only, and in tension, and that the concrete itself is sufficient to form the web and compressile part of the compound beam. This is a most important advance on the mere idea of a central iron core giving bearing power, and stiffened against buckling by the action of the concrete. Without reproducing some of Mr. Hyatt's diagrams, it would be difficult to render precisely intelligible the details of his experiments, and the reasoning deduced from them. It must suffice to say that he shows that, in theory, the compressive resistance of the amount of concrete which can be packed around and above a piece of bar-iron representing the lower flange only of an iron beam, is rather greater than the compressive resistance of the web and upper flange of the beam would be, in the ordinary proportions of sectional area; that, therefore, when the beam is thus imbedded, the upper portion, which is in compression, is waste strength, and can be dispensed with, the concrete doing its work. The advantage in economy of material and in fireproof character is of course obvious; and that the facts bear out the theory is shown by the statement, in diagrams and figures, of the results of a number of tests carried out for the author by Mr. Kirkaldy; the composition of the various beams, and the relative proportions of iron and concrete, are shown in good-sized diagrams, with the results of the tests, from which it is evident that the iron coring is proportionately stronger the more it is concentrated at the lower edge of the beam; in other words, the more completely it is in the position of *tie* iron. The most satisfactory beam, in regard to the relation between amount of material and results, seems to have been one in which the iron appears in the shape of a few thin slips 2 in. deep laid parallel at a distance of 2 in. from one another, on edge, the lower edges coinciding with the soffit of the cement beam, which is 8 in. or 9 in. thick. An increased depth in the iron raises the breaking load of the beam, but by no means in proportion to the increase of scantling in the iron. The concrete is held in position in the first instance by a series of transverse wires passing through and connecting the iron slips at right angles; and these wires also serve the very important purpose of mechanically connecting the metal and the concrete so as to incorporate them in one system, and prevent any sliding the one over the other when the beam is loaded so as to produce a sensible deflection. But will the two materials, thus forced into mechanical connexion, work together harmoniously under the influence of heavy strains producing extreme tension and compression? This question naturally occurs; and this is Mr. Hyatt's answer:—

"The compressibility and extensibility of cement were investigated by experiments with a bar of hard cement ten days old. This bar was made sufficiently long to admit of the insertion therein of two fixed points 50 in. apart, one of the points being the bent end of a rod lying upon the outside of the bar of cement and parallel with it, and which rod extended to within a short distance of the other point, thus leaving a space sufficiently small for accurate measurement on the cement being subjected to pressure. To prevent bending, the cement bar was placed in a frame fitting loosely about it, and yet sufficiently tight for the purpose. The load was then applied gradually by means of a lever, the actual compression from time to time being ascertained by tapering pieces, which were measured by Holtzapffel's thousandths gauge. In this way the compression was ascertained to amount to ·048 in 50 in. with a load of 1,000 lb. per square inch, the bar returning to its original length on removal of the load. This gives the ratio of expansion as ·00096 of length for 1,000 lb. per square inch, or say, in round numbers, the one-thousandth part of length; and if the ultimate compressive strength is taken at 2,000 lb. per square inch (which is perhaps the safe figure, considering that concrete in practice, and not neat cement, will form the compressive member of the compound beam) the final compression will be the $\frac{1}{500}$ part of its length. Now, as wrought iron is found to extend the $\frac{1}{1000}$ part of its length for each ton of strain per square inch, it follows that at 20 tons, or say prior to rupture, it will extend the $\frac{1}{50}$ part of its length, or about the same compressibility as cement; the effect of which in the compound beam is to keep the neutral axis at the centre line of the beam, the entire tensional strain being thus thrown upon the metal tie. The results of the Kirkaldy tests already alluded to confirm these conclusions.'

There is another form of combination which Mr. Hyatt shows in some of his sections, in which the iron is arranged in two flat layers one over the other, as if the two flanges of the iron beam were left and the web removed, the concrete taking its place. This has advantages in certain positions, where it is desired to keep the thickness of the floor at a minimum. There are diagrams also of brick beams formed by square flat bricks placed on edge with their flat sides in contact, and the whole connected by iron tie-rods run through and bolted at either end, and taking the tensile strain, the upper edges of the bricks taking the compression. These do not appear to have behaved satisfactorily under tests nor should we have expected it.

We can only quote one more passage as to the resistance of the Portland cement concrete to fire and water: we presume the experiment refers to the new Portland cement mentioned by the author; the test is certainly severe. A tie-metal and cement floor, in gridiron form, was laid down, and a furnace formed under it; the floor loaded to the extent of about 300 lb. to the square foot over the surface, which caused a deflexion of about $\frac{1}{32}$ in. in a span of 12 ft. "The fuel was arranged to form an incandescent bed 6 in. thick at 12 in. below the under-surface of the concrete slab. The fire being kindled at six o'clock in the morning, had by eleven become an intense heat perfectly uniform over the entire surface, and the bottom of the concrete was also at a glowing red heat all over. At this intensity the fire was kept up until four p.m., a period of ten hours from the lighting of it. During this time the slab had deflected $\frac{3}{8}$ in. A stream of cold water was now thrown forcibly against the bottom of the slab for a period of fifteen or twenty minutes, by means of a garden force-pump, and the load then removed. On examining the underside of the section it was found uninjured; and the next morning, being then entirely cold, the deflexion had disappeared, the slab having returned to its former level. In order to confirm these results, a second trial was made; this time the load was left upon the slab, which, during the firing, deflected as before, but upon cooling returned to its original level, *lifting the load with it.* In proof of the heat of the furnace it may be mentioned that in the course of this experiment the faces of all the side bricks in actual contact with the fire were melted."

The book is an exceedingly useful and suggestive one; so much so that we rather regret that it has not been published in a manner to render it more available for general circulation. One mistake we noticed; on page 16, lines 6, 7, the test numbers "874, 844, 845, Plate C," do not correspond with the numbers of the enlarged examples on plates I, J, K, to which the reader is referred; there has been some error in the references.

* **An Account of some Experiments with Portland-cement Concrete combined with Iron, as a Building Material, with reference to Economy of Metal in Construction, and for security against Fire in the making of Roofs, Floors, and Walking Surfaces. By Thaddeus Hyatt. London: Printed, for private circulation, at the Chiswick Press. 1877.**

PROFESSOR E. M. BARRY'S LECTURES AT THE ROYAL ACADEMY.*

ITALIAN RENAISSANCE.

IN passing from the Transitional style, or rather mixture of styles, which existed in this country during the Elizabethan era, we shall now have to notice that which is called the Renaissance,—a new birth of light and freedom, according to some; a mischievous re-awakening of pestilent heresy, in the eyes of others.

During this lecture and the next, which mark the conclusion of the term of my office as Professor of Architecture, it will not be in my power to do more than suggest for your consideration some of the various principles which determined the course of the movement, and it must be left for other opportunities, and, perhaps, for another mind, to pursue the subject. Having pointed out to you the influence of various ages and styles on Domestic architecture, I wish, however, before the close of my addresses, to say something about the remarkable effect of the new taste, which made itself felt in every walk of life, and changed the whole course of the architecture of the time.

We have remarked that, in England, the process of change was slow; old customs were not easily departed from, and compromise was tried in almost Protean variety, before the old architecture of the Mediæval days was set aside, and the "Gothic manner" proscribed as unworthy of an age of enlightenment.

The chief impulse had come from Italy, that beautiful land which had ever been the chosen abode of art, even when most cruelly torn by domestic dissensions and by civil war.* There, architects had long been engaged in working out the problems, which were now but slowly emerging into prominence amongst

* **Fifth Lecture, delivered February 28, 1878.**

ourselves. While English Gothic architecture was passing through the Tudor period, the great giants of the Italian Renaissance had been guiding what was, indeed, an artistic revolution. The quasi-Gothic Duomo in Florence had received its cupola at the hands of Brunelleschi. Bramante, San Gallo, and Michelangelo had been in conflict at Rome, a conflict ended by the triumph of the great Florentine; while Palladio at Vicenza, and Sansovino in Venice, had developed a manner of their own, from which all Gothic feeling was excluded.

The artistic influence of Italy was felt throughout Europe, and in considering its effect upon ourselves, it may be well for us to notice, before passing onwards, some of the leading characteristics of the Renaissance in that country, and the interesting state of things of which it was the result.

It must be borne in mind, that the Classical revival was not an artistic movement only, or even chiefly; it affected society in its relation to literature and philosophy, as well as art. When, therefore, we speak of the Renaissance, the term must be understood in a wider sense than one of architecture.

Hitherto we have been dealing with gradual alterations, not so much of style as of detail; and with successive eras of settled rules, developed each from its predecessors, according to well-understood laws and precedents.

Architecture was now to take a new departure. The revival of Classical literature in the fifteenth century marks an epoch of change; a change of religious and artistic thought; a Renaissance, or new birth of intellectual freedom; a discovery of the unknown treasures of an ancient civilisation. Hailed with enthusiasm in the land which seemed to be marked out as the legitimate successor to the glories of Greece and Rome, the new faith soon spurned its narrow boundaries, and set out as a peaceful revolution to conquer the world.

The Latin nations were easily subdued, and in France and Spain, the Renaissance had a speedy victory. In England, the resistance was more stubborn, and the result less certain. The adoption of strange forms in the architecture of this country were partial and hesitating; and it was not until the troubled days of Charles I. that the full force of the Classical revival in Italy was felt among us.

The change here was naturally more difficult to effect than it had proved to be in Italy, for our architects had been more fully imbued with Gothic principles than was ever the case with their Italian brethren. It was not possible for the Italian architects to be ignorant of the achievements of Classical antiquity. The glories of ancient Greece might indeed be unknown to them, save by some vague tradition, but the works of imperial Rome were at their doors. Amphitheatres and baths had their tale to narrate of departed grandeur. The Colosseum remained in its silent majesty, and all around, and under their feet, were relics of the treasures of ancient art.

The architects of Mediæval Italy, therefore, stood in a different position from that occupied by the English. They knew that; of which the latter were uninformed, and this knowledge had an influence upon their work, in the direction of eclecticism. In the earliest Christian buildings,—the basilicas,—traces of Classical influence are almost invariably found, as was, indeed, only natural, for the Christians, as they gained in power, were able to wrest the pagan basilica from its original possessors, and convert it into a church for their own use. In the long horizontal lines of the basilica, with its regular arrangement of columns and arches, the Italians scarcely broke with Classical precedents, and these influenced them, more or less, throughout their employment of Gothic architecture.

The difference between English and Italian practice is seen, not only in general composition, but in every detail of the work, as well as in the ruling principle, which underlies the whole. Take, for example, almost at random, any of our great cathedrals. There is a mystery about them; the whole effect, whether of plan or elevation, cannot be grasped at once; there is little reliance on particular features, still less on special ornamental details. We are conscious of an aspiring grandeur, seeming to direct our thoughts to heaven, and although research will discover much beauty of parts, it is the general effect of the whole which first affects us. We may trace the same principle throughout, whether in the varied treatment of the elevation, with its gradations of heights, its gables and pinnacles, its turrets or its spires, or in the solemn gloom of the interior, endless apparently in its vistas, mysterious in its arrangements of recesses and chapels, with an intricacy of piers and arches, like some vast grove of sacred palm-trees.

With the Italians, it was altogether different. A plainness of treatment was apparent. Simplicity of plan left comparatively little to the the imagination; everything was clear and open to the eye of the observer. In the same spirit, the exterior displayed large plain spaces of walls; the horizontal lines of Classic art were but half abandoned, and the high roofs of the Northern Gothic found no place. The pointed arch, moreover, the glory of Gothic architecture with us, in the use of which our artists revelled, and with which they dared so much, was but timidly adopted by the Italians. Often used in conjunction with the round form, it was but one feature among many, and not the ruling idea of construction.

In their fondness for plain surfaces, and breadth of effect, the Italians even seem to have regarded the arch as an enemy. It needed buttresses, and these would break up the surface, and thus were not acceptable. Rather than resort to their aid, arches were tied by iron rods at the springing, an expedient which would have been rejected with disdain by the more scientific builders of the North.

We see, then, that the English architects worked on different principles altogether from the Italian. They knew but one style, and made it their own; troubled by no traditions, except those handed down from fathers to sons, as to succeeding craftsmen, or such as were imposed upon them by ecclesiastical precedent. Speaking broadly, it may be said that their construction was marked by Mystery and Intricacy; while the Italian displayed Plainness and Simplicity.

The latter qualities, however, were not inconsistent with much richness of accessory ornament, and a frequent employment of the sister arts. The northern cathedral was complete, when the workmen left it. In the South, the artist found his opportunity, after the building was finished. The simplicity of the latter enabled him to regard it as a shrine, or frame, for the painters' and the sculptors' art. Colour and sculpture were lavished in mosaics, pictures, figures, shrines, metal work, and gilding; and thus it was that, while the great Gothic churches amongst ourselves seemed like the creation of one thought,—the realisation of a single dream; the Italian edifice was the result of a general co-operation of associated art, each man bringing his share of power, his artistic instinct, his skill and talent, to cast as an offering into the treasury of God.

We thus find that in Italy there was a greater *combination of art*, than with ourselves. The whole effect was less dominated by a single idea, or set of ideas. There was consequently less unity of purely architectural design; but a greater amount of general artistic wealth. The variety of outline, and picturesqueness of structure, of northern work was absent, and the lack of interest thus caused was supplied by the efforts of artists, working with much independence, each in his own class of work, whether frescoes, statuary, mosaics, bronze, or such-like accessories to the architecture.

A similar employment of the resources of art, in all their beauty, would have been impossible in our own Mediæval buildings, the architects of which shunned plain wall surfaces, breaking them up in every way by shafts and arches, large windows, buttresses, and recesses; and we all know how incongruous is the effect even of fine modern sculpture, when placed in a cathedral, such as Westminster Abbey.

To the Italians the union of the Fine Arts was merely a continuation of tradition; a development rather than a change.

They had never consciously abandoned such views of design, although in the early days of Christianity, they had, to some extent, turned their backs on art, as on an unclean thing, needing purification from heathen stains, before it could be admitted into the service of the Most High.

The first Christians found sculpture devoted to the sensual, and to them, revolting representations of the gods and goddesses of heathendom; personalities, with at best only human perfections; and displaying all the passions and weaknesses of men and women. This was not the art which the early Christian wished to perpetuate. He had not broken with the old worship, with its graceful mythologies of Nymphs and Dryads, to content himself with the contemplation of merely human perfections.

These were but the accidents of existence, and the deification of the body was to disappear in the life of the soul. What to him were these deities and heroes, their Fauns and Satyrs, all bearing the stain of a common degradation? The spirit of Christianity taught him to look not to the present, but to the future; to eschew pleasure, and even to welcome pain, in a rapt contemplation of the goodness and power of an unseen Presence; spiritual, omnipotent, and indescribable.

The old Greek sculpture, in its quiet repose, its well-satisfied acceptance of earthly things, seemed out of place to Christian men and women, who with the sincerest feelings of the heart disturbed, were crying with passionate eagerness for a new heaven and a new earth; a dispensation of Divine love, purity, and virtue.

To minds like these, the very beauty of olden art was an offence. Their worship must be spiritual, and the exquisite forms in marble around them were detested as incentives to idolatry. If art were to be admitted within the Christian sanctuary, it must at least be purged of all debasing associations. Christian disciples had not broken with the old Faith, to allow the new one to follow in its wake; the object of their veneration was no longer an image fallen down from Jupiter, but a mighty invisible Power, a deity not made by hands. From this time, therefore, all must be changed in art, as in religion. Henceforth, the saints would be portrayed as relying, not on earthly perfections, but on spiritual virtues.

Thus came about a complete revolution in art, and its effects were but slowly realised, by successive steps, until reaction set in, at the time of the Renaissance. Sculpture, hitherto, as being less flexible and adapted for the change, from Pagan to Christian ideas, had fallen, more or less, into disuse, while painting had more readily adapted herself to the new theology, and had even seemed to be invigorated.

The former was in a great measure limited to the work of decoration, and the sculptured effigies of tombs. Feelings of reverence, reserved the highest subject of all from the natural treatment belonging to Greek art; and a similar feeling of reticence enforced an alteration of treatment upon all plastic art, when devoted to the purposes of the sanctuary.

Painting was less trammelled. It had before it a larger field of selection of subjects, and a more elastic medium of expression. It is not a necessity of painting, to such an extent as it is of sculpture, that it should devote itself to pleasing representations of repose and physical perfection.

The whole tangled web of human affections, passions, and sentiment lies before the painter of genius. He is, therefore, at once more powerful and more versatile than the sculptor can ever be. He rose to the occasion. What the sculptor had been to the pagan temples, that would the painter now be to the Christian church. Starting from mythology and legendary art, he would delineate the loveliness of virtue, the hideousness of vice. At one time, his canvas might display the saint-like endurance of martyrs, and the anticipations of celestial joy; at another, the unutterable woes of the condemned.

If there were any wish to recur to the exhibition of human perfections, it could be gratified by the idealisations of purity and maternal love, in pictures of the Madonna; or manliness and constancy in those of St. Sebastian, St. Stephen, or other recognised saints. Painting, therefore, soon found for itself a home, in the altered state of society, brought about by the transition from the heathen mythology to the hagiology of the Christian church.

In the earlier times of the new faith we find art brought to bear on subjects, rather than on individuals; on the great mysteries of religion, rather than on detailed episodes. As we approach the Renaissance greater freedom is observable. The human form is again brought into prominence, and with something of a return to Greek traditions.

The change was a sign, amongst many others, of impatience of ecclesiastical control. Art would no longer submit to monastic leading-strings. It would insist on liberty, with all its far-reaching consequences. The Church had long claimed it as her own, only at last to find herself powerless to resist a movement, the aim of which was to restore that worship of beauty,

which she had ever regarded as an unholy bequest of Pagan irreligion.

Everything was therefore becoming unsettled, and ripe for change, when the Renaissance asserted itself in Italy. The Fine Arts, in all their branches, were so welded together, that all were in equal expectancy. Architecture, had never thoroughly separated herself from the old order of things. Sculpture had but unwillingly consented to a recognition below its claims, while Painting was displaying a freedom, in itself a herald of coming change.

The necessary impetus was found in the revival of letters, and the teaching of Petrarch and Boccaccio. The eyes of men were again turned to the records of Greece and Rome. Classical traditions were revived, and a new energy was everywhere apparent. Gothic architecture in Italy was declared an intruder, and a recurrence to the forms of ancient times, was demanded.

The revival was almost necessarily founded on Roman rather than Greek art. The Renaissance architects of Italy soon found out (as we have done much more recently), that Greek temples cannot be adapted to modern uses, without losing all that makes them exquisite in art. The pure and refined simplicity which forms their charm is lost in the endeavour to add a flexibility, opposed to the spirit of their conception.

The Romans had acted, from the first, on this conviction. Admiring the beauty of Greek art, they imitated it, indeed, as in their temples; but they did not acquiesce in the limitation of power, which exact imitation of these models would have imposed upon them.

Greek architecture dealt with large stones, arranged in the simplest manner. A single lintel reached from column to column. If we consider the construction a development of wooden precedents, we may say it was a system of beams of stone, instead of timber.

The Romans, like the Goths, delighted in the arch, and when the latter feature was accepted, the peculiar rest and repose of Greek architecture was gone for ever. In its place we have magnificence, daring, and power; an energy of construction, disdaining obstacles, and pressing science into its service. This may be seen in most of the great works of the Romans, which exerted a powerful influence on the style of the Renaissance architects.

The latter were unwilling, or perhaps unable, to break all at once with the past. Like the transitional builders, in our own country, they at first sought a compromise, and as a result, we have buildings like the Certosa at Pavia, a mixture of discordant details, combined with much fancy. Here is found imitation of Classical forms, with an exuberance of ornamental detail, altogether inconsistent with the refinements of true Classic taste. It was, however, a sign of the times,—an attempted blending of the Past and Present,—a breaking of the ties which connected the architecture of the day, with Gothic Mediæval art.

The same spirit of fusion may be noticed in the Florentine palaces, the windows of which are divided by shafted mullions, as of old, while the arches above are treated in a manner which recalls the days of tracery. Afterwards, came the more complete rupture with Gothic ideas, in the Renaissance palaces of Venice, the town-hall of Vicenza, and St. Peter's at Rome.

It has been customary to divide the Renaissance into three periods illustrated by the two types I have mentioned, and by a third, which marks its decadence. Starting from almost the commencement of the fifteenth, and lasting until the end of the sixteenth century, the Renaissance movement occupied nearly 200 years in its passage from birth to decay.

The periods of development have been variously styled. The first, which began early in the fifteenth century, and ended with it, was a time of experiment; old habits were modified, but not abandoned, and Classical ideas were clothed in Gothic dress. The severity of the latter style was passing away; there was a fusion of principles, an attempted reconciliation of Christian and Pagan ideas. The early Renaissance may therefore well be called the Transitional style of Italy, and it exhibits much of the same process which we have traced in the Transitional architecture of our own country, of which I spoke in my last lecture.

The second variety of Renaissance had not a long existence. It coincides with the first half of the sixteenth century; but although short in duration, it was a period of great activity, and to it belong some of the finest buildings of the revival, such as, in the case of secular edifices, the town-hall at Vicenza, and among churches St. Peter's at Rome. At this time the old Gothic traditions had faded away, the pointed arch no longer lingered, and the architects looked for inspiration to the works of the Romans, so that the phase of the style, used by them may fairly be called Roman Renaissance.

This was soon followed by the third method, which marked at once a more perfect study of ancient monuments, and a decay of originality; the one leading to a scholastic system of rules, the latter to poverty of detail and decay of the inventive faculty. We may call this the Pedantic school, and with it the history of the Renaissance, as an active and progressive movement, comes to an end.

Having thus classified the three periods, let us retrace our steps, and examine some of the peculiarities of each phase of the revival movement, although we can only do so briefly, on the present occasion.

You will remember my pointing out that painting was, in an especial manner, the art of the pre-Renaissance age in Italy. Both sculpture and architecture were reduced to subordination at the outset of the new movement, which culminated perhaps in the design of the Sistine Chapel, in which the painter is supreme, and the sister arts have scarcely a footing.

We shall find, further, that in the early school of Renaissance, the architecture was peculiarly of the type that has been termed Painter's Architecture. This title implies no disrespect to our painter brethren, but implies a tendency to rely on principles of design, which apply to painting, rather than to our less tractable art. Thus, a painter has a flat surface before him. It is for him to cover it with his subject. He has full mastery over his effects of light and shade, and is under no trammels as to materials. The architect, on the other hand, must design his effects, not as they appear on canvas or paper, but as they will be built up for him by the hands of others. He must always be thinking, so to speak, in "the round," and he knows that mere surface decoration, often charming in painting, will never make a fine building.

Raffaelle's beautiful arabesques enchant us in their proper place, painted in panels of the loggie at the Vatican; while similar designs, executed in stone, not only fail to satisfy, but even vex us by their obvious unsuitability to the material employed. At the Certosa, before referred to, the surfaces are covered with sculptures, which are merely copies of pictures of arabesques, executed in low relief. It is impossible not to admire in them much beauty of detail, but we feel that they are added to the architecture, and are not of it, and that they often even interfere with more legitimate effect. They are characteristic of the love of detail to which I have before alluded, in referring to the difference between Northern and Southern Gothic art.

The early Renaissance architects followed out these principles, and decorated their buildings with everything which the taste of the period could supply, until the building itself might almost be regarded as a case to contain art, rather than a work of art itself. Purity of architectural outline and detail thus suffered, and architecture was stifled by the well-meant caresses of her sisters.

How far this process had gone, and how much mischief it had worked to the architect, may be seen by a comparison of Giotto's campanile at Florence, with the front of the Certosa: the one executed as early as the beginning of the fourteenth century, the other a specimen of the Early Renaissance. Both are decorated as highly as seems to be possible, and although there are essential differences between them, no one can fail to detect evidences of a certain agreement in the principle which has governed their decoration. If the one may be called Gothic, with a dash of Renaissance, the other is no less obviously a fusion of Renaissance forms, with a reminiscence of Gothic traditions.

Both examples illustrate the method of design called Painter's Architecture, for both rely on surface effects; rather than on constructive forms, for architectural effect. In the Campanile, we find a superficial decoration of incrusted marbles; at the Certosa the ornament is also applied, in the form of panels, basi-relievi, and an elaboration of detail, which, in its minute character, does not combine with the architectural lines. Again, we notice in both buildings the prevalence of horizontal forms, and this, indeed, is even the more strongly marked in the earlier example.

Giotto's tower displays, in a typical manner, the peculiarities of the Italian Gothic school. There is nothing in it of the vigour of the North; much of Southern softness, and voluptuous refinement. Bold projections, with strong contrasts of light and shade, are shunned, and even the shadows of the angle turrets, which serve as buttresses, are toned down by canting their sides. In its straightness from bottom to top, the structure gives an idea of instability. It seems as if it had suddenly grown out of the ground, rather than that it had been placed deliberately upon it.

The vertical effect thus produced, and which, at first sight, might appear to be truly Gothic, is marred by the prevalence of horizontal lines, which are, indeed, so marked, that the composition is divided into distinct stories, while at the top every vertical line is merged in a strongly-marked projecting cornice.

The beauty of the building is mainly dependent upon:—first, the proportion of the mass;—secondly, the graduations of the openings, and proportions of voids and solids;—and thirdly, the refinement of finish which pervades the whole. These are the points in which a painter architect of genius, such as Giotto, might be expected to excel, and they are here controlled by a purer and more severe taste, than the Renaissance artists of the Certosa possessed.

In the latter building, there is little beauty of form, and none of general proportion. The openings appear as if they had been pierced at random, having no relation to each other, in size, shape, or gradation. The harmony of lines observable in Giotto's Campanile is absent, and we have in the same front, arches and pediments; straight lines and curves; wide and narrow openings; large columns and small; arcades with mullioned windows, of all sizes and proportions. To harmony has succeeded discord,—to order, confusion.

The one work is a work of architecture, decorated in subordination to form and intention; while the other is architecture in name only; but, in reality, a peg on which to hang excessive and inappropriate decoration. It illustrates the dangers which beset the architects of the Renaissance, in their attempts at fusion. It was obviously impossible to carry them much further in that direction, and this was soon evident to artists of cultivated taste. They consequently soon began to seek for more purity and refinement of style, more appropriateness of decoration, and more constructive skill. The result was seen in the works of the second or Roman period of the Renaissance, rendered for ever illustrious by the names of Bramante, Michelangelo, Raffaelle, Sansovino, and Palladio.

Of the great achievements of the three first-named artists at St. Peter's and elsewhere, space would fail me to treat now; but it may help us to understand the spirit which was directing the Renaissance movement, if we turn our attention briefly to specimens of the works of the two latter architects at Vicenza and Venice.

At Vicenza, Palladio carried all before him, so much so, indeed, as to give his name to the later development of his favourite style. He lived to illustrate in his own works, the change of manners which was passing over the art, for between his latest achievements, and the great work of his early career, the Town-hall at Vicenza, there is a marked difference. This particular design of Palladio's is a fair specimen of the architecture which succeeded the more florid structures of the previous period.

It is also interesting as proving the completeness of the change which had passed over public taste. The central building, which is the town-hall itself, was and is Mediæval in its architecture; for Palladio did not build it, but only clothed it, so to speak, with arcades; and these he designed, in the then established Classic manner, without the least regard to the Gothic associations of the original structure. The success of his work serves to illustrate again all that has been said of the half-hearted manner in which Gothic architecture was received south of the Alps; for without asserting that there is real harmony between the old basilica and Palladio's arcades, the combination has, nevertheless, been admired by common consent, and certainly need not offend the most fastidious, by incongruity.

We may realise the difference between the hearty employment of Gothic architecture in England and France, and the way in which it was treaty in Italy, if we picture to ourselves

the result that would be obtained, if some modern Palladio were to surround Westminster Hall with Italian colonnades, two stories in height.

The work of Palladio, in this example, is so simple, that we are almost at a loss, at first, to decide in what its merit consists. In the first place, as it seems to me, its very simplicity is the first thing to be noticed with approval. The composition is clear and intelligible, the corridors are obviously convenient, and an appropriate adjunct to a public hall used by crowded assemblies. This instinctive recognition of appropriateness is at the very root of true principles of architecture, and applies to every real style.

Again, Palladio's arches are wide and spacious, and thus lightness of effect is produced. The proportion of width to height in these arches has been criticised as excessive; but in this opinion I am unable to agree. The charm of the arcades would indeed soon be lost, if a greater heaviness and solidity were imparted to them, by diminishing their span. Here, again, comes in the question of propriety, for as the arcades are, after all, nothing more than covered balconies, and have not to support any superincumbent weight, they require no more strength than is necessary to sustain themselves; and this, it is evident, they possess in abundance.

To those who object to the application of columns to Renaissance elevations, the use of the orders by Palladio will be an offence, but it is difficult to suggest how their place could be satisfactorily supplied, and we cannot, therefore, wish them away. They are applied, rather as a decorative detail than as a part of necessary structure, and, after all, they do but follow in the wake of the panelled arcades and applied shafts of Mediæval art. Taken altogether, this work of Palladio may be termed one of the most successful achievements of the Italian architectural Renaissance.

From Vicenza it is easy to pass to Venice, and here the better style of the period had also been making its way. The accumulation of wealth in the great Italian towns had led to palace building, and Venice was a city of palaces. Perhaps the example which is best known to us, as illustrating the period, is Sansovino's great work, the Library of St. Mark. Facing, as it does, the Doge's Palace, it marks, in the clearest manner, the contrast between the Gothic and the Renaissance architecture of Italy. Both buildings are thoroughly Italian, and at the time of their erection could not have been built anywhere else.

The great palace of the Venetian Republic has been surrounded by such romantic associations that it has asserted an influence over the imagination, which is scarcely sustained by a calm examination of its artistic merits. The stirring memories of Venice people its arcades with shadows, recalling the glories of the past, and perhaps kindling in Englishmen an especial interest in all that relates to the "Empress of the Adriatic," the mistress of the sea.

Nevertheless, if we abstract our minds from everything but actually existing architectural beauty, the Doge's Palace will, I think, fail to satisfy. At Vicenza we have noticed the weakness of Palladio's arcades, and justified them by the fact, that they have nothing but themselves to sustain. Here we have arcades, also weak, but above them is a mass of enormous, and as it appears, unnecessary weight. If the upper story had been kept back, as it is at Vicenza, and the arcades had thus become covered balconies, as they are there, the effect would doubtless have been more pleasing; but the front, in its present state, can only be regarded as an attempt at a great work, rather than a perfect result, successfully achieved.

I do not speak now of the charms of detail, which the building displays, and which, in itself, is enough to make it always famous; for such beauty is not enough to compensate for the grave defects of unpleasing proportions and suggested instability. It is, indeed, impossible to believe that the bald and box-like upper part of the palace can have been designed by the same mind which worked out the often exquisite details of the lower stories.

No one would, at least willingly, destroy his own work, and no skilful architect would place all his weight at the top of a building, and all lightness below. The design bears, I think, on the face of it, evidence of having been altered in its execution, and of being the work of different architects. Regarding the lower arcades separately, as perhaps the most beautiful examples of Italian Gothic art, we discover in them the same taste for regular and horizonial treatment to be found elsewhere, and in this respect they contrast in detail rather than in principle, with Sansovino's colonnades.

In the latter design we recognise to a great extent the same principles which guided Palladio in his arcades at Vicenza; we have the same superimposed orders, with arcades on each story. The latter are, however, compressed laterally so as to give a greater solidity of effect, suitable to a structure which is an actual building, and not an ornamental appendage only, like the open balconies of the Town Hall.

We may notice that, in his upper story, Sansovino availed himself of a favourite expedient of Palladio, by introducing a second and smaller order, subordinate to the principal order of each story. By so doing, he not only obtained variety, but also an effect of size; he, in fact, gave scale to the whole composition, which was all the more necessary from the position of the building, placed as it was immediately opposite to the great mass of the Ducal Palace, and exposed to be dwarfed by it.

The chief difference between Palladio's work and the library at Venice is to be found in the upper cornice and entablature of the latter; and although this feature is perhaps somewhat disproportionate, it serves to mark with dignity the completion of the building, and is highly decorated with sculpture. Sansovino's library is certainly one of the most beautiful buildings of its time, and displays an application of Classical detail to modern usage, which has influenced powerfully the architecture of our own days.

I have not left myself much space in which to allude to the third period of Italian Renaissance, which does not, however, call for lengthened description. I have termed it Pedantic, because it was a time of words and rules, rather than of living facts. The aim of its architecture was to be correct, rather than interesting; to repeat exactly ancient details and contours, rather than to catch that spirit of art, which vivifies all it touches.

Michelangelo, during his long career, witnessed the change which was approaching. His sympathies, however, were elsewhere; for his fervid nature could ill brook precision of rules. Moreover, his admiration of Bramante is well known, and Bramante occupies the foremost rank among the best Renaissance architects of the Roman period. Michelangelo, when called to St. Peter's, condemned any interference with Bramante's designs, and declared that it was "impossible to deny that Bramante was as great in architecture as any man has been, since the days of the ancients."

Bramante's mantle, however, had now fallen into inferior hands, and architecture was losing its character as one of the fine arts. The later achievements of Palladio did not realise the expectations excited by his earlier work at the Town Hall of Vicenza.

The strength of the movement seemed to be exhausted, and both in literature and art lassitude was creeping onwards in the minds of men. Scholarship had lost its zest and art its invention. Both were dull and lethargic, and corruption ruled over society, while, in public affairs, the gathering cloud of the Northern Reformation threatened the framework of the body politic.

In the later works of Renaissance architecture, the degenerate spirit of the times was visible. The researches of Vitruvius, and his precise directions of forms and proportions, were eagerly studied by Palladio, and the architects who formed his school; and thus an artistic renaissance which began in florid exuberance, ended in the cold formalities of an insipid pedantry.

The changes in architecture had corresponded with those of literature and the sister arts, with which, indeed, it must ever be connected. Architecture cannot, in truth, retain a place among the fine arts without such association. Without the traditions which cling so lovingly around each old monument of the past, without sculpture, and the assistance of the art of painting, architecture must soon become a matter of science alone, a question of putting bricks or stones together, so that they may not fall.

In literature, and in art, the revivalists sought at first to copy principles correctly, and when a certain measure of success had brought satiety, the copying of principles became a blind imitation of forms, and all richness of style and development of invention was lost. The once prized Latin literature ceased to please, and the pedantry of architecture was succeeded by the rococo extravagances of the past Palladian school.

Nevertheless, the Renaissance style of architecture cannot justly be said to have failed. It impressed its influence on the whole of Europe; it found a home in every civilised state; and we shall notice, in the next lecture, its operation in England.

We have of late years witnessed a recurrence to Mediæval forms, with what permanent results, it is perhaps too soon as yet to decide. Englishmen, however, will not readily proscribe a style which has given us the architecture of St. Paul's and Whitehall, of Somerset House, and the majority of our clubs, banks, and great commercial buildings.

Like all schools of art, the Renaissance had its extravagances, and by dwelling on these alone, it is not difficult to ensure its condemnation. But there must be something worthy of consideration, in a method of building, which has withstood all assaults, and still holds its footing, in spite of the passionate denunciations of sectional criticism.

Instead of resorting to the easy course of undiscriminating censure, it may be worth while for architects to consider, whether the artistic successes of our various revivals have been such as to justify us in shutting our eyes to a style which may yet be capable of great achievements; which craves and welcomes the assistance of the highest sculpture, and the most dignified painting; and which in modern times has been deliberately adopted by almost all civilised countries, for their most important works of architecture.

ART-COPYRIGHT.

THE subject of copyright in works of art, often and so far unsatisfactorily discussed, is likely to come a good deal into notice during the present year, when the report of the Royal Commission on the subject of copyright shall be published. Most of our readers are aware, probably, that such a commission has been for some time sitting, though it has not been clearly understood whether its investigations were confined to the more popular and better understood subject of literary copyright, or embraced that of other productions of the intellect. We believe, however, that we are correct in saying that the object of the Royal Commission has been the preparation of a basis for consolidating legally the whole subject of copyright, or the right of the authors and inventors of works in art or literature to reap the profit of the labour of their brain, and to protect themselves against dishonest reproduction or imitation.

In regard to literature, the justice and necessity of an efficient protection has been long and generally recognised, in theory at all events. In regard to works of art, there is a much less general consensus of opinion, except among artists themselves; and we have heard able and clear-headed practical men, who were not specially acquainted with artistic subjects, express the greatest surprise that painters or sculptors should demand copyright at all, and profess an inability to understand the footing upon which such copyright should be asked for.

Perhaps a few words on the subject may therefore be useful at present, the rather as we shall have to show that one art,—that of architecture,—with which we are the most closely concerned, has been almost entirely passed over and neglected up to the present time; and it is at least worth while to consider whether this undefended position of architectural design is or is not a necessary or a desirable consequence of the special conditions of the art, which no doubt stands on different ground, in some respects, from such arts as sculpture and painting.

That solid claims on the part of artists, for protection from piracy, have been recognised as reasonable in law and equity, is proved by the number of existing Acts relating to artistic property. It may be interesting to some of our readers if we give a brief summary of the Acts which have been passed in order to protect the producers of these works; a summary which will also give an idea of the confused and involved state of the law in regard to art copyright. The first Act of the kind was prepared (in 1734) at the instance of one of our greatest painters, Hogarth, not, however, in reference to his paintings, but to his engravings, which had been largely pirated and imitated; and it is worth notice that the engravers have taken the chie

part in the movement in favour of legal protection, far more so in general than the painters, who are usually less of business men, and averse to legal proceedings; and though (as we shall have occasion to observe), they have been at many times monstrously robbed and ill treated, they have contented themselves often with a kind of cynical and satirical grumbling against rogues who were too much fenced in by legal ambiguities and tortuosities to be reached without a great deal of annoyance and trouble to the prosecutor, of a nature peculiarly repugnant to the artistic temperament. And Hogarth himself got little satisfaction out of his own Bill, since, although the Bill (8 Geo. II., cap. 13) set out by denouncing in no measured terms the "print-sellers and other persons who have of late, without the consent of the inventors, designers, and proprietors of such prints, frequently taken the liberty of copying, engraving, and publishing base copies of such works, and designs, and prints, to the very great prejudice and detriment of the inventors, designers, and proprietors thereof," &c., and provided that the inventor or designer of the plate should have the sole right of reproducing it for fourteen years from the first publication, it was shortly after "ruled" by a judicial authority that piracy from an engraving made *from* or *after* an original design was not within the jurisdiction of the Act, as the purchaser of the engraving from the original designer had no such property in the design as to entitle him to sue at law. The special object of this apparently futile Act was to protect the art of "engraving in the form of mezzotint or chiaroscuro"; and it provided that any one who should publish or expose for sale any fraudulent copies of a print should forfeit all the copies found on his premises, and 5s. per day in addition. The next Act (7 Geo. III., cap. 38) was also connected with Hogarth, for it was passed (1767) especially for the benefit of his widow, and was described in its heading as an Act "to amend and make more effectual" the previous Act already referred to. It extended the right of copyright ownership from fourteen to twenty-eight years after production, and extended the operation of the Act to all kinds of engraving ("the art of designing, engraving, and etching"); but it omitted the injunction against selling or exposing for sale, and consequently no penalties for selling pirated prints could be recovered under this Act, though the initial Act of producing the imitation or pirated copy is forbidden. The Act contains a special clause relating to William Hogarth and his widow, stating that the term of fourteen years was near expiring, and "base copies" of Hogarth's engravings had been published, whereby the sale of the originals had been greatly lessened, "to the detriment of the said widow and executrix," who was by the same clause given a sole right of printing her husband's engravings for a term of twenty years. It is not always that the law shows so much of personal charity in its dealings.

Ten years later it was again found that the legislation on the subject had been ineffective, and we have (17 Geo. III., cap. 57) "An Act for more effectually securing the Property of Prints to Inventors and Engravers, by enabling them to sue for and recover Penalties in certain Cases" (1777), the object being, as the title implies, to give greater facility for the enforcing of the provisions already made in previous Acts. It is noticeable, as one of the many sources of confusion in the copyright legislature as it now stands, that the clause forbidding that any one should engrave or etch in mezzotinto or chiaroscuro, or otherwise, "or in any other manner copy" any print which is protected, is still a matter of uncertainty in its application to photography, the law not having decided whether the words quoted cover copying by photography, or whether they can only be applied to modes of copying of the same kind as that of the original engraving. Inasmuch as the reproduction of engravings by photography is one of the most common and popular traffics of the day, it is apparent how inadequate is the protection afforded at present in regard to this branch of art.

The protection of sculpture first comes before us in (38 Geo. III., cap. 71) "An Act for Encouraging the Art of Making new Models and Casts of Busts, and other Things therein mentioned" (1798). The preamble sets out with the refreshing statement that "divers persons have by their own industry, pains, and expense improved and brought the art of making new models and casts of busts and statues of human figures, and of animals, to great perfection," and provides that every one who shall make or cause to be made (which seems to mean artist or purchaser) any such work, shall have the right to prosecute any one who copies it during a term of fourteen years, provided the name and date are put on the work. The difficulty of applying the methods of legal phraseology to the description of works of art is obvious in this Act, for it is really difficult to say whether it refers to original sculpture or only to making casts from life, and Lord Ellenborough remarked of it that the sculptors had better not "model" the next Act themselves. The said next Act (54 Geo. III., cap. 57) is, in fact, specified as an Act "to render more effectual" the previous one, "the provisions of the said Act having been found ineffective for the purposes thereby intended," and the special object of it was to extend the protection more distinctly to original design in sculpture,—"any subject being matter of invention in sculpture." An addition to the wording which is significant is that, after the provision of the last Act about any cast or model of the human figure, is added the phrase, "clothed in drapery or otherwise," from which we may gather that attempts had been made to evade the previous Act by the pretence that drapery or dress was not "the human figure." This Act (1814) left the term of copyright the same, but gave heavier penalties and more ready means of legal action.

The next Act we come to is that of "6 & 7 Will. IV., cap. 59," which, however, merely extended the copyright of prints and engravings to Ireland. We now come to the Victorian age, and find a very elaborate Act (5 & 6 Vict., cap. 100) "to consolidate and amend the Laws relating to the Copyright of Designs for ornamenting Articles of Manufacture," repealing a former ineffectual one passed in the second year of the same reign. In this Act the principle of registration of designs first appears, but it has really more bearing on manufactures, such as calico-print designs, than on art in the higher sense. It was amended and extended in its application by "6 & 7 Vict., cap. 65," but both these Acts lie rather out of our special subject in their application. Next comes an Act of some importance (13 & 14 Vict., cap. 104") "to extend and amend the Acts relating to the Copyright of Designs" (1850); important in this way, that, in a most illogical manner, sculpture was dragged into it (though the Act professedly is of the same class as the two last-named), and the application of registration to sculpture designs was then first made. Accordingly, sculptors get their protection from the joint operation of two rambling and ill-expressed Acts of Geo. III., and from a provision edged in sideways in a later Act having special and professed reference to quite another class of productions: and that is how the matter of sculpture stands to this day.

A further extension of the "Designs" Acts was passed in 1851 (14 Vict., cap. 8) with special reference to the protection of exhibitors in the Exhibition of that year. The next two Acts (21 & 22 Vict., cap. 70, and 24 & 25 Vict., cap. 73) are still occupied with the same class of work, "designs for ornamenting articles of manufacture," and it is not difficult to understand why art of this class, so nearly approaching often to the conditions of manufacture, and with which the interests of manufacturers and purely business men are so much bound up, should have received a larger share of legal attention than the Fine Arts. The next and last Act we have to name is for us at present the most important of all, that entitled "An Act for Amending the Law relating to Copyright in Works of the Fine Arts, and for Repressing the Commission of Fraud in the Production and Sale of such Works" (25 & 26 Vict., cap. 68). This Act, dated July 29, 1862, was the first in which the "authors of paintings," as apart from engravings, obtained anything like recognised legal protection. The fact of its being passed was in great measure due to the action of the Society of Arts, which formed a committee and took a large body of evidence on the subject, and also in some degree to that of Mr. E. M. Ward, R.A., who was, we believe, instrumental in drawing their attention to the subject, in consequence of the failure of his efforts to stop piracy and copying in relation to works in which he was specially interested. The main principle of the Act may be summed up in its first sentence,—"The author (being a British subject or resident within the dominions of the Crown) of every original painting, drawing, and photograph which shall be or shall have been made either in the British dominions or elsewhere, and which shall not have been sold or disposed of before the commencement of this Act, and his assigns, shall have the sole and exclusive right of copying, engraving, reproducing, and multiplying such painting or drawing, and the design thereof, or such photograph, and the negative thereof, by any means and of any size, for the term of the natural life of such author, and seven years after his death." That is what the Act professes to do; providing, however, that in selling a work of art the person disposing of it disposes *ipso facto* of the copyright also, unless he receives a written agreement to the contrary at the time. The term seven years is but a short one for the author's heirs and assigns to have the benefit of his intellectual work; if we consider the provision made for Hogarth's widow in the above-mentioned Act of Geo. III., we must regard such a provision as this as a step backward in the legal view of the assignable value of an artist's productions. Otherwise the object of the Act, as stated in the above quotation, is comprehensive enough; and if we consider that previously to its passing the law recognised, as shown by a ruling in a test case, no property of copyright on the part of a painter except in the case of a picture "exhibited as a diorama" (!), we must admit that the Act of 1862 marks, or should mark, an important era in the legal protection of artists. Why it has not succeeded in its objects, in what principles and details the existing law fails, we may now attempt very briefly to indicate, partly with the view of showing what ought to be looked for at the hands of the Legislature in any new Bill which may be the result of the inquiries of the Royal Commission which is just, we believe, terminating its labours.

The fact that there are nine existing Acts in regard to copyright in works of art, all in force, and requiring in many cases to be taken in conjunction, before the artist can make out what his rights really are, is in itself enough to indicate a necessity for reform. That the subject involves no necessity for a complicated legislation was distinctly stated by an eminent legal authority on copyright, Serjeant Burke, in a paper read before the Society for the Amendment of the Law on the 1st of June, 1863 (only a year after the passing of the last Act). The whole French law, which is far more complete and more easily put into action than our copyright law, "would not occupy more than a page or two in print," whereas our laws would fill a volume, and, "with their provisoes, restrictions, and contradictions, seem to delight in marring the object they have in view."* The same authority shows very pointedly the unsatisfactory nature in detail of the present laws. Sculptors come very badly off. The Act, 54 Geo. III., cap. 56, "gives the sculptor fourteen years copyright, and fourteen years more if he be still living at the end of the first fourteen, and have not assigned. There is no registration, and nothing required to secure copyright beyond the name and date of the first publication to be engraved on the piece of sculpture, so that whether the author be living or not at the end of the first fourteen years, or whether he have assigned, are matters his copier may find out as best he can." On the other hand, those professors of "'igh art," as *Punch* used to put it, the photographers, get more favour than any of the real artists. The photographer can obtain summary justice in a police-court against any one infringing copyright in even so trifling a matter as a *carte de visite*. But if the photographer make a fraudulent reproduction of a valuable engraving, the fruit of some years' labour and the expenditure of hundreds or even thousands of pounds, the engraver can take no summary process, but can only proceed to legal action which may be almost indefinitely delayed by legal formalities and the difficulty of reconciling and applying the multifarious provisions of the law in regard to engravings. One salient instance of this difficulty, arising from the want of any provision for immediate seizure in our law, is

* One of the most amusing instances of this is in regard to what is half an artistic and half a literary subject, namely, dramatic copyright. Our International Copyright Act forbids the representation here of unauthorised translation of dramatic works represented in foreign countries, but adds that "*nothing contained herein shall be so construed as to prevent fair imitations or adaptations to the English stage of any dramatic piece or musical composition published in any foreign country.*" Considering the present relation of our theatre to that of France, it might almost be supposed that these words were deliberately written in a spirit of cynical satire.

mentioned among the evidence collected at various times by the Society of Arts. "With great difficulty, and at considerable expense, an eminent firm of print-publishers at length succeeded in finding out a manufacturer of pirated copies of their engravings. From adjoining premises they actually saw the process going on in the delinquent's garden, and yet the law afforded them no means of seizing the piratical implements and copies." This significant anecdote we extract from the "Reasons" printed by the Society of Arts to accompany a model Fine Arts Copyright Bill which that Society endeavoured to get passed a few years since, and which, had the attempt been successful, would have gone far to remove all necessity for further legislation or for the inquiry of the present Royal Commission. The Draft Bill and the "Reasons" are well worth the attention of those who are interested in the subject of art-copyright; copies of them can be obtained, we believe, from the Secretary of the Society of Arts.

The confused and intricate nature of our present art-copyright legislation, and the varied and apparently quite arbitrary terms of protection, in regard to time, extended to different arts, stand seriously in the way also of the very important question of the International Settlement of Artists' Rights. As communication between various countries becomes in every respect nearer and closer, the importance of some general International understanding becomes the more evident. In regard to the present state of things we cannot do better than quote and thereby give circulation to the following summary from one of the paragraphs of the Society of Arts' "Reasons" for a Fine Arts Copyright Bill, before alluded to:—

"The following appear to be the several terms of *Artistic* copyright allowed by the thirteen States with whom her Majesty the Queen has entered into international copyright convention. In *Prussia, Saxony*, and all the other German States, the term is for the author's life and *thirty years* after his death. In *France* it is also for the author's life and (by the new law of 1866) for *fifty* years after his death. In *Belgium* it is also for the author's life and twenty years after his death. In *Spain*, it is for the author's life and twenty-five years afterwards; and, in *Italy* it is (under the new law of 1865) for the author's life, or forty years from the date of publication, whichever may prove the longer term. But at the expiration of such forty years, although any one may then make and sell copies of the work, the person doing so must, during a second term of forty years, annually pay to the proprietor of the copyright five per cent. (calculated at the *published* price) upon all copies sold by the person so making and selling such copies. As to France, her copyright laws are expressly extended to all her colonies; and, by the eighth article of her Majesty the Queen's copyright convention with France, dated the 3rd of November, 1851, *reciprocal* protection is agreed to be given in favour of copyright works *first* published "in the territories of France," or "in the British dominions." This appears to show that both States clearly intended that such reciprocal protection should extend to their colonies. It is also stipulated by the 7th article that "pirated works *shall be seized* and destroyed." Now the French law very justly declares the piracy of copyright property to be a crime (*délit*), and provides rapid and effectual means for enabling the proprietor of the copyright to seize both the pirate and the fraudulent copies, plates, &c., in his possession. Yet, according to the present state of the British Artistic Copyright Laws, no such powers of seizure, as expressly agreed by her Majesty the Queen's convention, exist in the British dominions; nor does any protection whatever for *artistic* copyright works extend beyond the United Kingdom; no, not even to the Isle of Man, or to the Channel Islands!"

Obviously, in such a case, the reciprocity is, as the Irishman said, "all on one side," or nearly so. It is worth remark that the Bavarian Government declined to enter into a copyright convention with this country, on account of the great difference in the term of years for which copyright property in works of art was assigned in the two countries; Bavaria giving, like Russia, a term of thirty years after the author's death. And our legislation is at variance even with itself. Our Engraving and Sculpture Acts, being founded by analogy on the Literary Copyright Act of 1710, gave the same term originally given by that Act, fourteen years, and subsequently increased it to twenty-eight years. But the Copyright Works of Art Act of 1862 allows it only for the author's life and seven years afterwards. Now the question of International relations in Art copyright is not only, we understand, one of those upon which evidence has been collected by the Royal Commission, but it has also occupied the attention of a special committee of the Social Science Association, formed in pursuance of a report of Mr. Carmichael, the representative of the Association at the International Art-Congress at Antwerp last year. There is therefore obviously likely to be a renewed awakening of interest in regard to the International aspect of the subject, but there cannot be much chance of getting very satisfactory relations with other countries until the machinery of our own law is put into better working order.

Two more words, in conclusion, in regard to the subject from the artist's point of view. We have referred to the fact that there are persons who seem unable to understand why artists should have copyright in their works. It must surely be admitted that if a poem or a novel, as the result of intellectual labour, has a claim to copyright protection, a painting or statue has equal claim. But it ought to need only a moment's consideration to show that the producer of works of this class, of paintings or drawings especially, has actually a claim beyond that of a literary producer, since not only his gains, but his fame also is in danger of material injury, by bad reproductions put forward in his name, and pretending to be his own work. In the case of the writer of a book, if his book is correctly reprinted, his fame is in no danger from a pirated edition,—it is even extended; the ideas are the same, whatever the "fount" of type used, or whatever publisher's name appears on the back: it is his pocket only that is picked. But it is otherwise with the artist. The maker of the pirated painting or engraving cannot really reproduce the artist's work; he can only pretend to do so, and persuade the public that his inferior work is that of the original artist. The latter may, indeed, apply Iago's celebrated reflection with added force,—

> "Who steals my purse, steals trash;
> But he who filches from me my good name,
> Robs me of that which *much* enriches him,
> And leaves me poor indeed."

He stands doubly in need of protection, and the rather that in most cases he is a man, from temperament and habits of life, much less qualified to look after his own interests than the literary man; a consideration which has been urged by the legal writer before referred to—Burke—as one additional motive for simplifying and consolidating the law of art-copyright. Genius, he says, is proverbially improvident; "the defensive structure, therefore, wherewith we are to shelter it should be of the plainest build and the readiest access: no labyrinth, no intricate paths should surround it." The recommendation comes with the more force from a member of a profession generally supposed to be so opposite in temperament to that of the artist.*

Our last observation is in regard to architecture. It is singular that no one of the writers and committees who have taken interest in the subject of artistic copyright seems ever to have thought of the architect as a person requiring protection of this kind. The only way in which architecture comes into our art-copyright law is in the provision against the fraudulent copying of engravings containing architectural subjects, among others. Even in the generally very complete draft Bill of the Society of Arts there is not a word about architecture. The author of an architectural drawing would of course have copyright in it as an original drawing; but we need not say that would be nothing to the purpose. There is really no provision, and no one seems as yet to have thought of proposing any, against any one copying stone for stone the building designed by another. Now in certain ways, as we have intimated, architecture stands on somewhat different ground from sculpture or painting. It is half a science, a practical matter; and even in regard to its artistic side there are differences of opinion among architects themselves as to the value or desirability of strongly-marked individuality in architecture. It is pointed out that among the Mediæval builders repetition of the same details, the same mouldings, of almost all the features and of the main idea of many of their leading buildings, was almost a matter of course. But it is the fact that, whether for good or ill, things are altered; and an architect is now a man who has an individual idea in regard to plan and elevation which he carries out in his own way; and as the law stands he is absolutely without protection. As a general rule, it may be said, conditions of site and wants of the owners vary so much that it is very seldom any one has any temptation to copy a building wholesale. Still, take a case which may happen, and which we know has happened: a house has been built in a certain district, and another owner intending to build, and thinking this house very picturesque, determines to build a reproduction of it for himself, employing the same contractor, who, of course, has copies of the architect's drawings. Is not the original architect in this case distinctly and nefariously robbed? And it is certain that he is utterly powerless to prevent it. We hope this portion of the subject of protection to artists will receive attention in any new measure that may be introduced pursuant to the inquiry of the Royal Commission; and as we know that the president of the Institute of Architects has been examined as a witness before the Commission, we may have reason to believe that the interests of the profession will have been properly represented in the evidence which, when published, will give us the latest and fullest information as to the present state of the subject of Art-Copyright generally.

* It is also, perhaps, in consequence of this very want of business habitudes of mind, that artists sometimes have not apparently been awake to the injury done to the purchasers of their pictures by the exhibition and sale of "studies," sometimes of as high elaboration as, though on a smaller scale than, the principal work. On this subject a curious correspondence between Miss Burdett Coutts and Mr. Faed, forming part of the evidence before the Society of Arts Committee of 1858 (and published in the Appendix to Underdown's treatise on "Art Copyright"), may be perused with advantage. It shows the misunderstanding to which the present state of the law may give rise on both sides, and the subject should certainly be considered in any reform of the present law. It is a startling, but not always an agreeable surprise, for a man who has paid a large sum for a picture by an artist of note, to find in another house a "study" of the same work, of which he thought himself the sole possessor, equal or perhaps superior in artistic merit and interest to the "original."

ARCHITECTURE AT THE ROYAL SCOTTISH ACADEMY.

NEITHER as regards the importance of the buildings, nor the architectural skill displayed in design, is there much calling for admiration in the drawings exhibited. There is a practical business-like propriety about them without any tendency towards Queen Anne or other vagaries. Even the churches are orthodox to a degree, and correspondingly devoid of interest.

A tamer and balder church we have seldom seen than the "Established Church, Portobello," as designed by T. B. McFadzen. It is a parallelogram with two tiers of lancet-windows on the flanks, without mouldings, and unrelieved by buttresses. There is a tower and spire at one angle, to procure which the remainder of the building has been sacrificed. Ecclesiastical architecture would not seem to be Mr. McFadzen's *forte*, but he has produced some mansions worthy of admiration.

The "United Presbyterian Church, Londonroad, Edinburgh," by J. Starforth, is a more satisfactory production; the spire is well developed, and not embarrassed by unnecessary buttresses, which have a tendency to narrow the apparent breadth of this feature. The side elevations have large three-light lancets under a retaining arch, there are double-gabled transepts, and the buttresses, although not well developed, are as much so as is generally the case in Nonconformist churches, and there is a tendency common to the designers of most of such churches to throw too much ornamentation into the principal front as compared with the remainder. There are schools at the rear of this church which group in well with it.

The design submitted in competition for the "Mayfield Church, Edinburgh, by Messrs. McGibbon & Ross," possesses many of the characteristics above enumerated, but in it the spire is buttressed, and the absence of transepts prevents much variety of outline.

Mr. Anderson's "Church at Stirling" displays his usual care and correctness; it is very graceful and thorough, but has not any peculiarities calling for remark, except it may be (what does not appear from the drawing), that whereas the exterior is of stone, it is proposed to line the interior with brick.

The United Presbyterian church at Stonehouse, designed by R. Thornton Shiells and Thomson, has the vestry-hall and schools arranged on either side of the principal elevation, so as to form a group and mask the body of the church, which, from the glimpse we get of it, appears to be of the usual parallelogram form. Where the church stands, amongst a row of houses, this arrangement is commendable, but it would rather appear from the drawing that this one stands in an isolated position, and, if so, from some points of view the grouping will be unsatisfactory.

A "church in brickwork" is a novelty in Scotland—that is to say, an architectural church designed in that material,—for there are many temporary makeshifts knocked up in inferior brick and plastered over. The "church at New Craighall," designed by Mr. Henry Hardie,

has considerable architectural pretensions, and is not without merit as a design; but the architect seems to have been unable to free himself from old practice, and the detail and general effect are such as could, with propriety, be produced in stone.

Messrs. Peddie & Kinnear send a different version of the "Craiglockhart Hydropathic Institution" from that exhibited last year. The style is the same,—rustic Italian,—but more emphasis has been given to the central tower, and the fenestration has more expression. The amended design will be more in harmony with the site (close to a hill) than the former one, with its narrow campanile.

Two villas at Grangemouth, designed by James MacLaren, are of considerable dimensions, and display vigorous treatment. They are in the Scottish Domestic style.

"Carelee, Peebleshire," is a residence which was designed by the late David Bryce, and now additions have been made thereto by David Robertson. As Mr. Bryce was a master in this department, Mr. Robertson was put to a severe test, and he has succeeded in making the additions in perfect harmony with the original.

"The Municipal and Police Buildings, Portobello," R. Paterson, is a not very satisfactory adaptation of the Scottish style, as applied to such buildings. The composition is stilted, the detail heavy, and every angle possesses its own little pepper-box turret,—a useless appendage.

Mr. F. T. Pilkington exhibits a view of the "Edinburgh Theatre, interior looking towards the proscenium," a memorial of its short-lived existence. It is a pity it could not be retained, as it was good of its kind, albeit decidedly French in character.

The tower of St. Giles's, Edinburgh, and its kindred, have taken deep root in the affections of a class of the Scottish architects. Something similar thereto is sure to be designed by them if opportunity affords; but, strange to say, few, if any, of these designs have reached fruition. The "Biggar Memorial Drinking Fountain, Banff," designed by J. Rhind, is after this manner,—rather heavy in appearance, but it requires something substantial to stand the sea breezes of the Banffshire coast.

"Ayton House, Fife," by David and John Bryce, is represented by a well-executed water-colour drawing,—a work of art in its way. The style of the mansion is distinctly English in character, and suitable to the situation, depicted as in a richly-wooded park. The flat red tiles used are a rarity in Scotland, and harmonise pleasantly with the foliage. The house altogether has a warm, comfortable aspect, very pleasing to look at.

Quite different, again, is the "Shooting Lodge, Loch Hope, Sutherland,—construction, chiefly Timber and Slate," William Fowler, architect. The situation is picturesque, on the slope of a wooded hill, and the lodge fits naturally into it.

The "Gillespie Memorial Hall, Kippen," designed by D. Robertson, must surely be intended to be used for ecclesiastical purposes,—it has every appearance of a chapel.

Messrs. Peddie, Kinnear, & Peddie have a thorough mastery over the Scottish Baronial style: "Kinmouth, Perthshire," is an example of their treatment of it, with which we are now sufficiently familiar. In the same style, and effective in grouping, is a block of street architecture at Portobello, designed by P. S. Deas; and good, too, although in a different style, is the block at Greenock, designed by Alex. McTavish, which has an effective line of dormers.

The "Fine Art Institute Galleries, centre of George-square, Glasgow, from designs by J. T. Rochead, prepared in 1850," is an academical reproduction of the Doric style, represented in a daintily-executed water-colour sketch. The greater part of the façade is hidden by foliage, but the portions shown indicate that the designer has a competent knowledge of the style with which he is dealing.

School Board Offices for Ipswich.—The Ipswich School Board has, after consideration, adopted a proposal to purchase the Masonic Hall (a red brick building erected about ten years ago at a cost of about 3,000*l.*) for the purpose of a board-room, offices, book-store, &c. The sum at which the building is offered to the Board is 1,350*l.* A portion of the buildings will be rented by the School of Art. The Town Council opposes the purchase.

ON SOME POINTS IN THE METROPOLIS LOCAL MANAGEMENT AMENDMENT ACT,

AND THE ERECTION OF BUILDINGS BEYOND THE GENERAL LINE OF THE STREET.

CONSIDERING how strongly Englishmen insist on vindicating all the rights of property, and how aggrieved people feel when Government, whether actuated by too fussy paternal notions or by the necessities of modern times, steps in and limits these rights, it is almost a matter of surprise that much litigation has not sprung out of the Acts for the management of the metropolis. But, on the whole, the local authorities, and those with whom they have had to do, have each been fairly forbearing one to another. But there is yet nothing more important than that persons should be acquainted with the actual state of the law, and the manner in which it has been developed. For it in no way takes away from the soreness felt by a disappointed and overthrown combatant to know that he is essentially in the wrong. The points on which we wish to touch in this paper are concerned with the 75th section of the Metropolis Local Management Amendment Act (25 & 26 Vict., c. 102), which it may be as well to set out with some minuteness. It runs thus,—"No building, structure, or erection shall, without the consent in writing of the Metropolitan Board of Works, be erected beyond the general line of building, in any street, place, or row of houses in which the same is situate, in case the distance of such line of buildings from the highway does not exceed 50 ft., or within 50 ft. of the highway where the distance of the line of buildings therefrom, amount to or exceed 50 ft. . . . . such general line of buildings to be decided by the Superintending Architect to the Metropolitan Board of Works; and in case any building, structure, or erection be erected or begun to be erected without such consent, or contrary to the terms and conditions on which the same may have been granted, it shall be lawful for the vestry of the parish or Board of Works for the district to make a complaint before a magistrate, who shall issue a summons, and if on the hearing of such summons this complaint shall be proved to the satisfaction of the magistrate, he shall make an order on such owner or occupier, builder, or person directing, of any such building, or as much as may be beyond the general line so fixed as aforesaid, directing the demolition of the whole of the building, or as much as the magistrate considers desirable."

Two prominent points arise in regard to the explanation of this rule. The first, as to the function of the architect's certificate; the second, as to the person to whom notice of the proceedings should be given. That is to say, in regard to the first head, whether, when the architect has certified as to the general line of buildings in the street, such certificate is final and conclusive, so that the magistrate is merely a ministerial person, whose only duty it is, as it were, to register the architect's decision; or whether he may form an independent judgment whether the architect's line is or is not the general street line. And with regard to this certificate, it is well to point out here that it has been decided that it may be given at any time before the case comes on for hearing, so that, in fact, if one architect gives a certificate at one time, and another at another time, it is quite possible that these two persons might have different views as to what constitutes the general line of the street. That, it will be obvious, is an important element in the understanding of the point, because it is clear that the magistrate becomes, in the latter case, much more of an umpire than if he had merely to decide whether or not a certain building, or part of a building, projected beyond a certain fixed and well-known line. The decision which finally set this question at rest, after it had been raised in two previous cases, was that of Simpson *v.* Smith (6 Law Reports, Common Pleas, p. 87), where a bay-window was erected in Stratton-street without the consent of the Board of Works. The Superintending Architect of the Board decided, by his certificate, the general line of buildings, and the bay-window was beyond the prescribed limit. Thereupon the case came before the magistrate, who considered that he was bound by the certificate of the architect.

But the Court of Common Pleas, consisting of four very able judges, came to the opposite conclusion, and held that "the certificate cannot be binding on the magistrate." The magistrate, therefore, becomes a judge of appeal from the decision of the architect; and we have in a previous case an instance of the way in which this procedure acts. We extract it, with some noticeable comments, from the judgment of the late Mr. Justice Willes:—"It seems," he says, "to be probable that it was meant that a small departure from geometrical straightness of line should not be subject to a penalty, and that in dealing with a question which was one merely of an eyesore and not a nuisance, the judge who had to decide should have some latitude in determining what had been done was merely a small matter coming within the rule *de minimis non curat lex*, or a substantial departure from the intention of the Legislature. The case of St. George's, Hanover-square, *v.* Sparrow is an instance of the reasonableness of this construction. The erection there complained of was a small glass conservatory on a balcony, which could have a very trifling effect on the beauty or uniformity of the street, and which a jury, certainly under the old law, would not have found to be beyond the regular line of the street. The architect who, in that case no doubt, conceived that the strict geometrical line of straightness was to be taken, decided that it was beyond the line. It is obvious that in such a case it is most wholesome that there should be some mode of correcting such a decision according to the dictates of common sense." These remarks are certainly sensible, and carry with them a good deal of weight. On the other hand, it is quite clear that the magistrate and the architect are persons of such an utterly different career in life that it is doubtful whether a magistrate, however learned in the law, is a good judge of appeal from the decision of an architect upon a question which is essentially part and parcel of the latter's business. We do not say that in the instance just given the magistrate did not arrive at a proper and sensible conclusion; on the other hand, it would be quite as possible that in another case the architect would be right and the magistrate wrong. *Primâ facie*, an architect should be a better judge, both of the actual line of a street and of deviations from it which do or do not mar or interfere with its beauty or regularity, than a lawyer. But such at the present time is the law, and if not wholly satisfactorily, it must stand for want of a better appellate tribunal than a magistrate. As it seems to us, a really satisfactory way of forming a proper tribunal would be in analogy to shipping cases, by allowing the magistrate to summon as his assessors two competent and independent architects to advise him, but not to form part of the actual tribunal. His decision then would be one which ought to carry with it all possible weight. Indeed, we venture to think that in matters wherein points of technicality are involved, assessors are not used enough in our Courts of Law. But this is not the place to go further into a question in itself of very considerable importance.

Turning to the second point, it will be observed to arise from the latter part of the section in question, where it speaks of "the owner or occupier of the premises, or the builder or person engaged in any work," &c. In the case of Brutton *v.* The Vestry of the Parish of St. George, Hanover-square, (41 *Law Journal* Reports, Chancery, p. 134), a Mr. Brutton was the lessee and occupier of a house in Mayfair, with a portico projecting beyond the front of the house, upon which was a wall about 3 ft. 6 in. high, at a distance of about 4 ft. from the drawing-room window. In the month of August Mr. Brutton contracted with a builder to erect on this portico a conservatory, and on the 15th of that month he began work. So long after as the 2nd of March of the following year the Superintending Architect of the Board of Works certified that the main front of the building in the street was the main line, and on the 4th of the same month the Vestry took out a summons against the builder, who had in the meantime gone away to Australia. It is not necessary to go through the intermediate steps, for they may form matter for some further observations on another occasion. Suffice it to say that the case came before Vice-Chancellor Malins for an injunction to prevent the Vestry from pulling down the conservatory, on this one, among other grounds, that the builder was not the proper person against whom to issue the summons. The judge very properly decided that the builder in the case was not the right person to proceed against, and he went so far as to say that he could not conceive a proceeding more unwarranted than that this summons should

have been served on the builder. "He had been paid for his work, and he had no more connexion with it after he went away, when his work was completed, than Mr. Brutton's footman, who might have been discharged on the same day." It is clear, indeed, that the Act in this respect must be construed with reasonable care, and that it is intended, as pointed out by the judge, that where there is a known occupier and builder the proper person to proceed against is the occupier or the employer of the builder, but not the builder himself. But the builder is named because, in some cases, the Vestry may not know who the occupier is or who employs the builder, and if the latter were not named there would be no person of any responsibility against whom proceedings could be taken. Moreover, it is equally clear that the builder in the above instance was not, and could not, be the person liable, since the Act expressly speaks of "the builder engaged in the work,"—not the builder who *has been* engaged, but the one who is at the moment occupied with the matter in question. And it is certainly surprising that a responsible body like a West-end Vestry, who can obtain the best professional assistance if they will pay for it, bearing in mind that a penny wise and pound foolish is the worst of all possible policies, should make such blunders as the whole of this case shows us. But to keep to the main point, it is evident that there is also a strong reason why the builder, where the occupier is not known, should be responsible, because if his building is stopped while at work he is prevented from earning his money, and will consequently communicate with his employer. But when the work is completed it might be actually advantageous to him that the house which he has just erected should be pulled down. Therefore we have this section,—one of immense importance to all persons connected with metropolitan buildings,—very fully interpreted by these two cases, which show with considerable force how carefully and prudently matters, which in any way intrench upon strict proprietary rights should be managed. These prohibitive statutes are absolutely necessary in an artificial and highly complex state of society, such as we see at the present time, where ignorance and bad taste are not far apart from the eccentricities of art. But they require careful handling; they are capable of working at times considerable injustice, and the courts of law have certainly leanings against those who, either without cause or without care, put them in motion. At any rate, however, this section of the Metropolis Local Management Amendment Act has been carefully explained by the Courts of Law, in regard to the two points as to the effect of the architect's certificate and the responsible persons in matters connected with buildings and structures which fall within the provisions of the seventy-fifth section, so that if these explanations are remembered future mistakes will not so easily occur.

THE GENERAL EXHIBITION OF WATER-COLOURS.

THE fourteenth general exhibition of water-colours, opened at its usual quarters in the Dudley Gallery this week, includes a good many beautiful and interesting drawings, the average being higher than usual, though there are not many works to pick out from the rest as remarkable or important. The exhibition is strong in landscape, but contains some good figure-subjects, among which may be mentioned especially the portraits by Mr. Clifford and Mr. J. C. Moore. Each of these artists has established a line of his own in water-colour portrait-painting, — the one in portraits of ladies, the other in those of children. Of Mr. Clifford's two portraits, which, as usual, are quarter length life-size (or nearly so), that of "Lady Margaret Compton" (106) is remarkably beautiful and effective as a picture, the artist having had a very fortunate subject for his powers. Mr. Moore's portraits of children present the usual characteristics of his style; a somewhat conventional and stiff treatment of his subjects in what is really decorative painting, in which a great part of the effect is derived from very beautiful and delicate harmonies of colour (or in some cases we might say of *tone*, rather than of positive colour) in the dresses of the figures, and in the artificial backgrounds of furniture, and hangings, and wall-paper, amid which they are set. We have before expressed an opinion that these works are somewhat too made-up in their effect, somewhat too deficient in the charm and freedom of nature to be considered thoroughly true to the highest aim of portrait-painting. They are, however, quite *sui generis*, stamped with the artist's own manner and genius; as colour-studies they are delightful; and in one of those exhibited this year, "Miss Daniel" (222), there is an exquisite grace and sweetness of expression in the portrayal of a young quiet girl just getting into her "teens." Another portrait which cannot fail to attract attention is that of "The Hon. Mrs. Lyulph Stanley" (308), by Mr. Walter Crane; a figure in warm yellow, approaching to orange, standing by a fireplace, in a room the furnishing of which goes to make a rich scheme of colour in harmony with the dress as the keynote; the drawing is very highly finished, and a success in every way, except in attracting interest to the countenance of the sitter, which, in fact, appears quite subordinate to its surroundings. His smaller work, called "A May Meeting," a young man and woman playing at lawn-tennis, amid the spotty foliage of a garden in spring, is full of talent and interest. Among other figure-subjects are some of Mr. MacCallum's coast studies,—figures and sea in bright sunlight, in which the treatment of the water, luminous as it undoubtedly is, seems to be getting a little like a trick of handling; we have it always the same. Mr. W. S. Coleman sends a pretty imitation of Tadema, in "Gold Fish" (262); Mr. Dollman's picture of "A Canine Æsculapius" (315) has real humour and brilliancy of execution; one or two heads by Miss Jennie Moore, in particular "Elspeth" (332), are good; and a large drawing called "Stranger in the Land" (501), by Mr. F. E. Cox, has merits which, to our thinking, might have claimed a better place in the hanging. Miss Kate Greenaway's various half-conventional studies of peasant children, to be found on the screens, must be recognised, no doubt, for their ability and humour, but they seem to us uninteresting, and in some instances too nearly approaching caricature. Compare them with Mrs. Allingham's little "Study of a Schoolgirl" (572), and their want of refinement and reality is obvious at once.

In landscape there are many beautiful and interesting drawings, more than we can undertake to name; and we notice with pleasure the predominance of works in which the sentiment of nature seems to be aimed at, besides the mere study of facts. A very beautiful and remarkable little work is that by Mr. Poynter at the top of the room, "Moonlight in Funchal Bay" (221), a most unusually real moonlight; and the manner in which the quiet but large swell of the sea, and the dip and roll of the ships, anchored in the middle-distance, are indicated, without disturbing the repose of the whole scene, is very fine. Mr. J. O. Long's "Frosty Morning on the Coast of Devon" is a suggestive study of somewhat similar type, though slighter. Mr. MacCulloch's "Harvest, Lochaber" (242), and Mr. Glennie's "Loch Eil and Ben Nevis" (263), are good specimens of drawings in which the effect of largeness of scale is obtained in comparatively small works. "A Moorland" (293), by Mr. J. Knight, shows some of his finest qualities, and Mr. Arthur Severn sends two really grand drawings, both dealing with remarkable and exceptional effects of nature; "Cromer after Sunset" (329), and "Sunlight effect over the Jura Lake of Geneva" (433); in the former we stand on a beach at the gathering of twilight, with a foaming surf rushing in, and the masses of the town standing piled against the last gleam of crimson in the sky; the Jura drawing is altogether an exceptional effect, one of those which perhaps we may say must be seen to be believed; but certainly its dazzling luminosity is most remarkable; comparing this with some other recently-exhibited drawings, however, we are tempted to express a hope that this gifted artist will not allow himself to be drawn away too much into attempting out-of-the-way and extraordinary effects—a kind of study which is very likely to lead to that worst evil in landscape-painting, a theatrical style. Mr. Pownall Williams sends a very interesting drawing, "In the Belfry of the Campanile at Torcello" (166), showing the shafts, with their heavy Byzantine-looking capitals, and below the straggling meanderings of the lagunes; his little drawing, "Through the Olive-yards" (173) has also much individuality. Among other noticeable bits among the landscapes are Mr. A. B. Donaldson's drawings, four in number, of which "Old Tower, Great Yarmouth" (13) is of special interest; one or two little things by Mr. Claud Hayes, which are full of feeling, especially a very small sketch on one of the screens (514); Mr. Ditchfield's "Near Boxhill, Sussex" (123); Mr. Grace's "Summer Afternoon on a Surrey Moor" (136); Mr. F. G. Cotman's "Quietude" (254), a small drawing in a very fine, broad style; and Mr. Napier Hemy's "Off for the Night" (401), a study of sea and fishing-boats, on rather a large scale, and up to his usual mark in excellence.

There are some good architectural subjects, among which may be named an admirable view of "Trafalgar-square" (229), by Mr. Herbert Marshall, in which topographical accuracy is combined with effect; and "A Yard in Rouen" (174), by Mr. Glennie, a capital study of old houses in strong sunlight The exhibition is also rather strong in flower-paintings, among which "Yellow Chrysanthemums" (55), by Miss Constance Phillip, and "Blackberries and Blossom," by Miss Norman (608), may be mentioned; and Miss Angell's study of "Azaleas" (230), in a jar of very real and translucent tinted glass, making a fine bit of colour.

NOTES ON JAPANESE ARCHITECTURE.*

ALL Japanese architecture, until the employment of foreigners within the last few years, has been, with very few exceptions, entirely of wooden construction. In certain parts of the country, where stone lies to hand in boulders, or is otherwise naturally exposed, there are a few instances of its use in the construction of the walls of small houses and simple temples. There is a small temple near Nikko, about 14 ft. square, of which the walls are built of oblong blocks of stone, placed upon their narrow ends, forming the whole thickness of the wall, without bond, and having all the external joints covered with a large plaster-roll to keep out wet. The roof is also formed of large slabs of stone hollowed out on the surface and cemented at the joints in imitation of tiles. In addition to this there are to be seen several stone bridges,—large stone walls surrounding the principal cities, solid stone monuments to the dead, imposing flights of stone steps, with stone railings leading up to the temples, lamps of stone and bronze adorning the temple precincts, bronze statues of gigantic size; and stone is invariably found employed in the pavement of courts, and as a substructure to wooden buildings in order to form a stable and dry foundation. On account of the constant fires which occur in the large cities, particularly during the winter, there are not many of the ordinary street dwellings which have not been repaired or rebuilt within quite recent times. The temples, protected by their isolation, and in many cases by thick groves, also many important dwellings set apart by themselves, can boast considerable antiquity, but the ordinary domestic and street architecture is of comparatively modern erection. Some of these larger dwellings of the nobles have fallen a prey to treachery and wanton destruction, others have been burnt to the ground through the introduction of European heating appliances into wooden walls, without precautions and protection. The Tokio Foreign Office, one of the finest old Japanese buildings in the capital, which was entirely destroyed this year by fire, is said to have been set on fire through a stove-pipe running through a wooden wall without any protection whatever. It appears, nevertheless, from such representations as can be found in books, that the arrangements and general appearance of the ordinary houses have not altered since very early times. They are fragile wooden structures, never more than two stories in height. The walls are constructed of a vertical and horizontal framework of posts and beams mortised together, filled in with bamboo laths, laid crossing, bound together, and coated with mud in several layers, being finally plastered over. Sometimes the beams and posts show, being flush with or projecting beyond the plastered surface, and sometimes the whole is plastered over, framework and all. This latter method is employed in larger buildings, and in the "kuras," or godouns. A kura is often many months in building, the mud, which is taken from the bed of some river, being spread over the framework in a great number of layers, each layer being allowed a long time

* From a paper by Mr. Josiah Conder, Soane Medallist for 1876, and Professor of Architecture at the Imperial Engineering College, Tokio, Japan, read before the Royal Institute of British Architects on Monday evening last.

to harden. The projecting timbers at the eaves are also thickly coated with the same clayey mud, and to the small window-openings are hinged shutters coated to a very great thickness with the same material. The whole surface of the building is then plastered over, and finally covered with a coating of lacquer. These kuras often remain standing after street fires, but they are by no means thoroughly fireproof, for the mud often cracks and falls off with great heat, and even under ordinary circumstances they require constant renovation and repair.

In the ordinary houses one external wall or more, and most of the internal walls, are not filled in with plaster, but are open between the uprights, being filled in merely with light wooden screens sliding past one another in grooves formed in the heads and sills of the framework, so that the whole partition can be thrown open at any part. Where light is required these screens are formed of thin wooden framework, divided into rectangles of some simple design, and filled in with tough translucent paper, or in some cases in interiors they are covered with paper, decorated with patterns or paintings. Each room opens into the neighbouring rooms, and passages are seldom to be found, except in the largest of houses. Sometimes, however, the greater portion of a room will be raised about 12 in. above the level of the entrance, leaving an L-shaped space or passage on two sides. The raised portion is covered with mats, and used by the isdwellers as the room proper. In small rooms the whole floor is on one level and covered with mats. These mats are always manufactured of one dimension (namely, 2 ft. 11 in. by 5 ft. 10 in., being twice as long as their width), and a room is invariably built, measured, and described, not according to its actual dimensions, but by its number of mats. They are made of rushes, neatly woven upon a light wooden frame, are about 1½ in. thick, soft, slightly yielding, and warm. The houses of the highest and lowest, as well as all temples, have their floors covered with these mats, a little differing in quality. There is generally in one wall of a room a small recess formed in the framework, in which are placed one or two rows of shelves, moulded, polished, and lacquered. These shelves are generally arranged in some quaint unsymmetrical manner, and both form an ornament to the room themselves, and serve for the display of vases or small ornaments. Even the lowest classes of the Japanese show great taste in judiciously disposing small treasures of good shape and colour to the adornment of their dwellings. They convert the smallest strip of land into a miniature garden, which they plant with well-trained shrubs and flowers.

The simple habits of the Japanese, both as regards resting and feeding, renders but little furniture necessary for the complete comfort of the householder. Small low tables, more like what we call trays, are used for serving up food upon,—one being set before each guest. A metal-lined box, or sometimes an ornamental bronze receptacle, is used for the small charcoal fire, from which warmth is obtained in cold weather. A room is invariably provided with one or more folding screens, which, as the inmates sit or recline on the mats, do not require to be of any great height in order to secure privacy, and keep off draughts in cold weather. Small chests of drawers are to be found in private rooms for clothes, &c., and these, as well as the hibachis, tables, and screens, are mostly of some elegant shape and pleasing design. If a house be of two stories, the upper story is reached by wooden steps, leading up from room to room, being composed of two strings with treads and no risers, somewhat inconvenient in their slope, and generally without handrails. The ceilings of the rooms are wooden, consisting of the underside of the floor-boards of the room above, crossed by the small joists supporting them, and sometimes smaller ribs between, dividing the surface into squares; the whole is polished or lacquered. Probably, in early times, houses of this class were covered with thatched roofs, projecting considerably at the eaves, or were covered with boarding and wood shingle. In country parts there are now many roofs covered in such ways, but most of the houses in the cities have heavy tile roofs of great projection, with large ridge and hip tiles and terra cotta ornaments at the extremities. The roofs are often slightly concave on their surface, resembling those found on a larger scale in the temples, from which they are undoubtedly copied.

The Shintoo Temples, which are built in imitation of the earlier temples of that religion, prior to the introduction of Buddhism, have roofs of two plane sloping surfaces, very salient at the ends and at the eaves; and it seems from this that the heavy curved and hipped roof, which now abounds so in Japan, was an introduction from Corea or China contemporary with the religion of Buddha. The tiles are always of a greyish black colour, and the joints are covered with a thick roll of white cement. One great peculiarity is the size of the ridge and hip ornaments, which are constructed of several courses of tiles and cement, forming quite a little wall along the ridge and hips, terminated by large terra cotta ornaments at the extremities. These ornaments are most of them very artistic in shape.

In houses of two stories the upper story is sometimes set back a little, the projecting portion below being covered by a small lean-to roof. There is often below this another flat roof, projecting some 3 ft. from the lower wall, to keep off sun and to protect the frail wooden entrances from wet. This roof is generally in part suspended from the roof above, and partly supported at wide intervals by light bamboo posts. Small gutters of bamboo are generally fixed to these lower eaves, with pipes of bamboo to carry off the water. In the hot season, "sudaris" (a kind of cane blind which admits air and permits outlook, and at the same time gives shadow from the sun) are hung from the eaves to the ground. The above description applies both to the dwellings of the lower and the middle classes, the latter being somewhat larger, more cleanly, and better furnished.

The tea-houses, or hotels, are on a much larger scale, and vary in their arrangements. They are very often planned on three sides of a little entrance-court laid out as a garden—a verandah, with a floor some 12 in. from the ground, running round these sides and serving as a passage from one room to another. The upper story also has generally a verandah covered with a salient roof, under the eaves of which paper lanterns are hung at night. In large hotels (called Yadoyas) there is generally a small interior court, in one corner of which cooking is conducted in the open air, the rest being laid out in some ornamental manner, with ponds, streams, shrubs, and stone lanterns. Round this is an interior verandah, and often miniature wooden bridges, enabling one to cross the court without dirtying the feet.

The dwellings of the higher classes, which are called "Yashiki" or "Miya," are considerably larger and more architectural. Their arrangement is very simple, being a group of somewhat low rooms, opening one into the other, having a lobby or hall at the entrance, and sometimes one passage from front to back. They are not more than two stories in height, and are covered with a heavy tile roof of wide span, with terra cotta ridge and hip ornaments, prominent eaves, often supported by a rich cornice of beams and brackets, and having elaborate carving displayed in the gable-ends. Over the entrance to the house there is a wide portico, supported upon strong posts, which are often moulded on the edges. The lintels, beams, and projecting rafters are also moulded on the edge, and carved with some flowing line of ornament, deeply incised upon the flat surface. Such ornament is very effective, being delicately and sharply cut, and can be seen from a great distance. The portico roof is either a continuation of the curved line of the large roof, or consists of a smaller roof intersecting this. In the latter case, a favourite form is that of a double ogee, convex at the ridge and concave at the eaves, forming a gable or semi-gable at the front. By this is meant that on the front, the curve of the roof is continued half way, and is then, as it were, cut off, showing the sides of the end rafters projecting, decorated with bronze clasps, and adorned with carved and pierced wooden pendants. In the large roofs the semi-gable is also a favourite form for the ends, in this case the upper portion being of the gable form, and the lower portion a sloping hipped roof. What I have called bronze clasps or belts correspond to what, if placed at the end of a beam, would be called shoes, being gilt and engraved plates of metal, placed in the centre of exposed beams and lintels, serving for no purpose but ornament. They are much used in Japanese architecture. The windows are generally greater in length than in height, being low oblong openings, filled in on the outside with thick wooden bars, arranged sometimes vertically and sometimes horizontally, the whole being open to the air. On the inside of these windows there are always sliding shutters or paper windows to keep out wet or cold in bad weather.*

THE ALEXANDRA PALACE BUILDING ESTATE.

IMPORTANT SALE OF BUILDING PLOTS.

THERE was a large attendance of persons interested in building at the Auction Mart the other day, on the occasion of the sale of several sites of building land forming portions of the Alexandra Palace Building Estate, the sale of which was legalised by the Act of Parliament obtained last session. The property offered consisted of twenty-one lots, and was described as the Muswell-hill site, comprising nearly four acres, this site being divided into ten lots, containing a little more than a quarter of an acre each; also the Wood-green site, containing nearly six acres, which was offered in one lot; and the Alexandra Park site, containing nearly ten acres, and divided into nine lots, containing about an acre each.

The first portion of the property offered was the Muswell-hill site, which was described as affording choice sites for residences. The conditions provided that a building line of at least 30 ft. from the road is to be maintained on this site, except at the flank sides of lots 1 and 10, where it is to be 10 ft. only. All the houses to be erected are to be private dwellings, and not more than two houses are to be built on each lot, the prime cost of which is not to be less than 1,000*l*. There was a spirited competition for each of the several lots, the first six lots being sold at an average of 600*l*. each. For lots 7, 8, 9, and 10, 450*l*. each was the highest offer, and they were withdrawn.

The Wood-green site, containing 5 a. 3 r. 27 p., was next offered. It was described as possessing a frontage of 1,575 ft. to Crescent-road, 40 ft. wide, which is to be finished at the sole cost of the vendors. It was stated to be well adapted for the erection of shops, or other business or commercial premises requiring space, and also for private dwelling-houses. After a close competition this lot was sold for 5,500*l*.

The last portion of the property offered was the Alexandra Park site, containing nine acres, three roods, and eleven perches. It was described as affording choice sites for villa and other residences, fronting a new 50 ft. road, which will be finished with the sewer at the sole cost of the vendors, and taken to by the Tottenham Local Board. A building line of at least 25 ft. from the road is to be maintained on this site, and all the houses to be erected are to be private dwellings only, and not more than five houses on each lot, the value of each house not to be less than 800*l*. prime cost. Of the ten lots comprised in this site, containing on the average about an acre each, the three first were sold at prices ranging from 1,200*l*. to 1,500*l*. The remaining seven lots were withdrawn, 1,000*l*. being the highest bid for each lot.

It will thus be seen that out of the entire number of twenty-one lots comprised in the property ten were sold and eleven withdrawn.

THE WANDSWORTH NEW VESTRY-HALL.

THE new vestry-hall which it is proposed to erect at Wandsworth is likely to be carried out on a novel principle, which has received the sanction of the Charity Commissioners. The estimated cost of the site is 2,000*l*., and of the building 5,000*l*., and it is expected that the building will, to a certain extent, be self-supporting, as it is intended to let it for public meetings and entertainments, as well as letting some of the rooms as public offices for the registrar of births and deaths. The original intention was to have defrayed the cost of the hall by a small rate, but it is now proposed, with the consent of the Charity Commissioners, that the trustees of the several parochial charities within the parish should purchase the land and erect the building, and then let it to the Vestry on a lease for ninety-nine years, with a clause in the lease providing that at the expiration of that period the Vestry should have power to purchase the hall at a small advance on the original cost. The proposed rental is to be 3¾ per cent. on the amount expended. We understand that this arrangement will be carried into effect, and the hall erected under its provisions.

* To be continued.

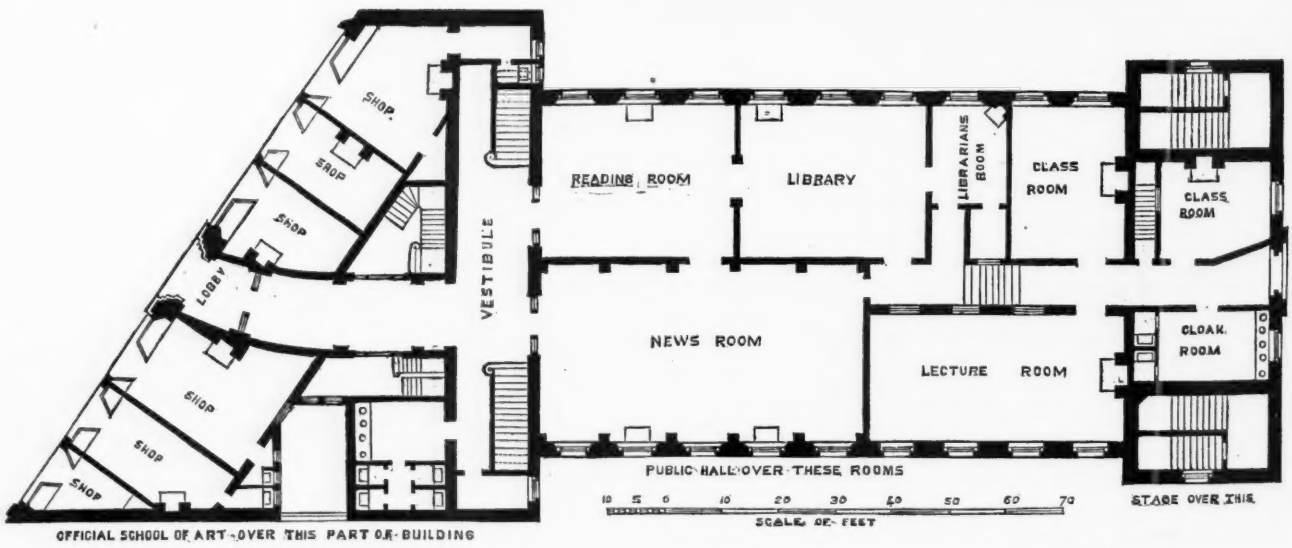
THE TECHNICAL HIGH SCHOOL, STOCKHOLM.—PROFESSOR SCHOLANDER, ARCHITECT.

THE TECHNICAL HIGH SCHOOL, STOCKHOLM.

THIS institution, of which we give an illustration, lately celebrated the festival of its inauguration. This solemnity was the fiftieth anniversary of its existence as the Technological Institute; but it may be traced much further back.

One hundred and eighty years ago Kristofer Polhem established his Laboratorium Mechanicum, for which he received from the State a yearly subsidy of 1,500 thalers, silver currency. The Laboratory had to migrate from place to place. First it had a home at Kungsholmen, next at Riddarholmen, and finally it was transferred to the Castle. It was as unfortunate with regard to its subsidy from the State. In consequence of the wars during the reign of Charles XII. it lost that support. It then served only as a museum of models, and about 100 years ago a catalogue of its contents was printed. Together with the School of Mechanics, established in 1798, it was placed under the supervision of the Academy of Arts, and was shortly afterwards removed to Mäster Samuelsgatan, No. 43.

When the Academy of Agriculture was founded, both the School of Mechanics and the Museum of Models were placed under its care. By virtue of the royal order of June 8th, 1826, the school was changed into a Technological Institute, and the Museum of Models was transferred to it. The premises mentioned above, at No. 43, Mäster Samuelsgatan, received within their walls the new institution, and in June 1827 the Technological Institute was formally opened, after the completion of the necessary alterations, which had taken up a whole year. Twenty years later it was entirely reorganised, was still further extended at a subsequent period, and in 1864 was removed to the present premises, erected after the plans of Professor F. W. Scholander. In 1869 a building for the School of Mining was erected by the side of the Technical Institute, and this year the Institute was changed into a technical high school, the only one in the country. It has a staff of ten professors and eight other teachers.



BARNSLEY MECHANICS' INSTITUTE AND PUBLIC HALL.—MR. HILL, ARCHITECT.

BARNSLEY MECHANICS' INSTITUTE AND PUBLIC HALL.

THIS building covers a space of 2,500 square yards. The frontage reaches the height of 60 ft. The news-room is 53 ft. by 30 ft.; the reading-room, 34 ft. by 27 ft.; and the library, 33 ft. by 27 ft. The large hall, including the stage and gallery, is 143 ft. long by 58 ft. wide, and will accommodate between 1,700 and 1,800 people. The school of art comprises large elementary room, 80 ft. long by 25 ft. wide; antique-room, 34 ft. by 16 ft.; and painting-room 24 ft. by 16 ft.

Mr. Hill, of Leeds, is the architect; and Messrs. Boothman & Broomhead, of Leeds, are the contractors.

THE PALACE OF JUSTICE, PARIS.—M. DUC, ARCHITECT.

THE PALACE OF JUSTICE, PARIS.

THE modern application of the word "palace" is often made, like many other similar things, a matter of fashion or caprice; but the word has not only a history, it has a meaning which becomes a nonsense or an indignity when qualified with places of entertainment like those of Sydenham or Muswell-hill, or, still worse, the public-houses of the metropolis and smaller English cities. The palace was the abode of the sovereign,—the "palatium,"—the eminence upon which the embodiment of power was raised, the enclosure within which the central authority was housed. Such was the Palace of Westminster, once the home of the English kings; that the name should still designate the halls and chambers of the legislature is perfectly consistent with tradition and fact. The king was the supreme judge upon earth of the people he ruled; in the palace of the king wrongs were heard and redressed, justice was administered. There was a reason for maintaining the English courts of justice at Westminster; there is equally a reason for giving the new Courts at Temple Bar the appellation of "Palace of Justice." The same argument applies with prior right to the Palais de Justice of Paris, for the new buildings, intermingled with the old walls and foundations of successive edifices, repose upon, within, around the precincts of the Palais, that is to say, the ancient residence of the kings of France. There, once upon a time, all the high business of the nation, regal, judicial, and official, was transacted. Once upon a time Paris was contained within the larger part of the island, partly occupied by the Palais, and now known as the Ile de la Cité. Lutetia stood upon one of five small islands, three of which have been incorporated by means of embankments and bridges. The Cité was the heart of mediæval Paris; the palace, the cathedral, the hospital still mark the site of the early capital. In the time of Henri IV. the completion of the Pont Neuf united the two western islands of the Seine with the Ile de la Cité. An equestrian statue of that king still adorns the bridge, which, unlike the other bridges connecting the Cité with the river banks, was never obstructed by habitations of any kind. The façade, which we publish in our present number, is the western front of the Palais de Justice facing, at a considerable distance, the statue to which we have just alluded. At the present moment tall houses line the road leading from the Pont Neuf to the *Place* recently opened in front of the new façade, and these houses are to be pulled down. A magnificent approach from the west will thus be completed, the eastern approach being from the Boulevard St. Michel, while the northern and southern façades front respectively the quays or embankments formed upon either shore of the island. The Palais de Justice is still an agglomeration of buildings of different styles and periods. Though its present successful isolation on the western side has been completed under the Republic the principal work of alteration, renovation, and reconstruction was done during the Second Empire. We have so repeatedly referred to the later additions that we can do barely more than string together descriptions already printed in this journal. For an idea of what the Palais was in the Middle Ages our readers ought to refer to the sketches published in M. Viollet-le-Duc's "Dictionary" (vol. vii., p. 4) under the head of "Palais." Very little if anything, except the Sainte Chapelle, remains of the mediæval buildings. The degradation to which, two hundred years ago, the Palais de Justice and similar buildings, in England as well as France, was subjected is well known. Boileau, in his "Lutrin," has described a part of that Palais which was probably rendered detestable to him by an uncongenial study of the law. In his time narrow passages and alleys led through tottering buildings now rebuilt, combined, and harmonised into one admirable whole; mendicants and street-hawkers established themselves in the old squares, under the old arches, and upon the old steps. Referring to the external stair of the Sainte Chapelle the author of the "Art of Poetry" sang:—

> "Par les détours étroits d'une barrière oblique,
> Ils gagnent les degrés et le perron antique,
> Où sans cesse, étalant bons et méchants écrits,
> Barbin vend aux passants des auteurs à tous prix."

Some long time afterwards, about a hundred years ago, the courtyard and façade towards the Boulevard St. Michel were begun by the architect Moreau; the interior of the building was remodelled during the reign of Louis Philippe, about the year 1834. On the 26th of May, 1840, a royal ordinance was published relating to the construction of a new Palais de Justice. The works already finished were made to form part of the new project, which referred principally to proposed buildings upon the Quai de l'Horloge and the Quai des Orfèvres, and to the façade, a view of which we are now giving. The group thus formed belongs partly to the Municipality and partly to the State. The Cour de Cassation which is included in the group is the property of the State, and M. Duc is the sole architect. The Palais de Justice is the property of the City or Municipality, and M. Duc has been assisted first by M. Dommey and afterwards by M. Daumet. M. Duc and M. Daumet, the son-in-law of M. Questel, are now the joint architects of the Palais. It should be remembered also that the architects of these as well as other equally important buildings in Paris are assisted by inspectors and sub-inspectors who are also architects. These inspectors (clerks of works) are nominated by the Minister or the Director of Civil Buildings, as the case may be; they are generally chosen from the more distinguished of the students at the schools of architecture in the capital. The relations of an inspector, a joint-architect, and the chief architect are often complicated,—at least they appear so to Englishmen. The inspectors at the Palais de Justice have enjoyed the right of private practice. M. Duc, the chief architect, was himself an inspector at the "July Monument" before he was appointed its architect. We are particular in enumerating these points, because they have much to do in rendering the public buildings of Paris the excellent works of art they mostly are, and they have probably contributed to make the Palais de Justice the comparative masterpiece it is.

The central portion of the façade in our view, is the Grand'Salle des Pas Perdus, about which so much criticism has been banded. It is a huge stone Hall, vaulted in stone. Entered from the external steps through three doorways,—the doors being of bronze,—it forms a vast approach to staircases of stone and marble leading right and left to the different parts of the building. The middle door of the Hall faces a central entrance reached by a few steps. This is a square-headed opening bordered by Ionic columns surmounting an entablature and a pedimented niche, within which is a seated figure of The Law, by M. Perraud; figures erect, one holding a torch, are placed upon either column. Beyond this opening, and seen from the Great Hall, is a figure of Justice, by M. Duret, placed in a niche at the foot of the staircases leading right and left. At each extremity of the Great Hall, and facing the doors at each end of the portico is an archway into a broad corridor leading through the building to that other Grand'Salle des Pas Perdus constructed by Jacques de Brosse, which was destroyed during the Commune, and thus gave rise to the report that M. Duc's building was a heap of ruins. Happily, however, the excited populace had the good taste to spare that portion of the Palais, which, of all buildings erected during the last forty years, offers the most vivid suggestions and discloses the greatest original efforts to inquirers willing and capable to see or comprehend the progressive art of their own time. Our readers must not misunderstand us. We do not refer with any approval to the newly-restored Galerie de Saint Louis, or, indeed, to any of the attempted mediæval effects which have been lately executed; any English architect of experience in early French and English architecture would have done better than M. Duc and his assistants have done in the Gothic parts of the work. We refer simply to the new Grand'Salle des Pas Perdus, to the staircases and passages leading out of it; and externally to the engaged colonnade with its broad flights of steps which, far from being the result of caprice, are necessitated by the fact that the floor of the second story of the Sainte Chapelle has been taken as the general level throughout the principal parts of the Palais.

We admit, at the same time, that the lines of M. Duc's Grand'Salle des Pas Perdus are unpleasing; we admit a preference for certain mediæval halls we could mention, for certain modern halls we could name. But that is not the point. M. Duc's Grand'Salle is a step in a new direction. The general arrangement of the entire hall; the coloured materials of the walls, columns, and balustrades; the vaults and arches of the roof,—should be conscientiously studied by the increasing number of men, young and old, who are trying to reconcile the opposing methods of by-gone art. All schools have agreed in praising the judgment which has heaped honours upon M. Duc, not for having conceived a beautiful work of high art, but for having done something that has not been attempted before. Even M. Viollet-le-Duc,—between whom and M. Duc there is a wide gulf both in the politics and the art of architecture,—has gone out of his way to praise the new Grand'Salle. In the second volume of his "Entretiens" he has added a foot-note of praise:—"La Salle des Pas Perdus, extérieurement et intérieurement," says he, "est un de ces monuments qui fera honneur à notre temps. Là tout se tient; tout est lié par une pensée claire. L'exécution, comme il arrive toujours, répond à la composition. Elle est belle et pure. On sent l'artiste, chose rare dans notre temps, qui respecte son art et le public." The conductor of the *Révue de l'Architecture*, M. César Daly, has accorded similar praise, and for the same reason. We ourselves, in an article* printed almost exactly two years ago,—at the time when M. Duc was nominated by the Council of the Institute of Architects to receive the Queen's gold medal,—gave our own reasons for heartily approving the selection. We declared that the New Grand'Salle by M. Duc was, though by no means a model of beauty, the great work of the day. We felt that, refined in all its details, it was, nevertheless, inelegant in outline. We said,—"There are modern works, even in England, more captivating in effect, and in which the superficial elements of beauty are more strongly marked; but since the revival of letters none have been erected which give, with greater decision, truthful expression to the thought and aim of the constructor than this one. . . . It is symmetrical without any forced regularity; utilitarian, and not crude; classical, yet devoid of pedantry. It proves not so much the genius of the architect as the pliability of orders, rules, and other antique *impedimenta*. The force of reason and common sense is there displayed in the manipulation of hard and cold materials, and its completion establishes a fact—promoted without a doubt by prolonged archæological researches in both Grecian and Gothic fields of art—that all the constructional forms of every country may be so adapted to the style and habits of the present time as to produce a harmonious result, provided always that the cognate principles of ancient and mediæval architecture be scrupulously followed and developed." We urged in fine that M. Duc leavened a profound knowledge of the ancient Greeks with an admixture of Gothic methods. He had thereby produced a scientific, truthful, and artistic building; and an innovation which a succeeding generation, working on similar principles, would be able to shape into beauty. Impressed with the conviction which we have just described, the judges awarded the Emperor's first and last prize of 100,000 francs to the author of the work we illustrate; and M. Viollet-le-Duc, whose own larger works, especially the restored Château de Pierrefonds, were cited against the single creation of M. Duc, afterwards admitted the justice of the award.

We should not describe with the same enthusiasm, or praise in an almost unqualified manner, this really great work of M. Duc were it not one executed under conditions totally ignored in this country and rare even in France. For nearly forty years M. Duc has been engaged in making designs and drawings for the Palais de Justice; and he has sacrificed the more than probable chance of a large private practice to devote himself almost entirely to this work. He is even pleased to make many, nearly all, detail drawings himself—no small task when it is remembered that everything movable and immovable within the building has been expressly designed and made. At the same time, the best workmanship that Paris can afford has been lavished upon the pettiest detail. A great deal of Echaillon, a very hard stone, veined, and susceptible of polish—only used of late years—has been introduced into the construction; and the so-called marbles of the Jura have also been employed. The joiners' work, which is of a very careful and beautiful description, has been executed by M. Mathérion; the old and well-known firm of decorators, MM. Huber, frères, have been entrusted with much of the internal ornamentation, the principal partner, M. Hamel, having devoted himself to the execution of wall

* See "M. Duc and some of his Colleagues," the *Builder*, vol. xxxiv., p. 181.

decorations of different kinds, as well as to models of all sorts for the architect's appreciation before the final completion of mouldings and sculpture. The plumbing and slating have been done by MM. Monduit and Bechet.

We have not yet heard whether the publication of a monography of the later portions of the Palais is in contemplation. Some excellent photographs of the Grand'Salle des Pas Perdus were presented to the Institute of British Architects more than ten years ago by M. Duc himself, and they may be found in the Institute Library. Those younger members of the profession who may chance to visit Paris during this year would do well to obtain an official introduction to some of the Inspectors engaged at the Palais, and so armed they would be sure of a cordial reception. They should ask to look over the working drawings in the architect's office, located in the building itself, before they diligently and modestly study the original points of M. Duc's development of nineteenth-century architecture.

ART CULTURE.

SOME earnest efforts are being made to increase the means for the study of art and the enjoyment of works of art in Manchester. In connexion with these Sir Henry Cole, not long ago, delivered an address to the Manchester School of Art, and as we have now his corrected version, we print some portions of it:—

Great Improvement in Works of Fine Art applied to Industry.

I have pointed out that schools of art exist in this country to cultivate fine art,—that is, to train workmen to produce works of art for the benefit of the whole people. If genius be educed by schools of art, that is a happy accident. Schools of art, I repeat, are not intended expressly to create genius, because a genius, as I have shown you, is only produced once, it may be, in a hundred or a thousand years. Mr. Poynter was followed in his lamentations by the learned head of a college in Oxford, who said that schools of art are not operative, even for the object they have in view. You may recollect that in 1853 there was a "chamber of horrors" in Kensington Museum, which consisted of a collection of samples of decorations of the most costly kind, which had no principles of decoration about them. That chamber produced a startling effect; it was talked about even in Parliament. There was one manufacturer in Parliament who made hideous carpets, and thought it was a cruel impertinence on the part of any Government to form this chamber of horrors, and show that his carpets were not quite in good taste. In answer to the Oxford rector, I maintain that such a chamber of horrors could not be produced now; the costly inartistic specimens have disappeared. You may find an ugly cheap coal-scuttle, but the productions of our best manufacturers are now much more consistent with standards of good taste than formerly. Architecture has enormously improved in the last quarter of a century; whilst I admit it might at times be founded on a little more good taste and common sense. You cannot go about the country anywhere without being much struck with the improved architecture in public and private buildings. Compare the stone churches now built with those ugly brick things erected by churchwardens seventy or eighty years ago. About the year 1820, nearly every church and chapel, and bank and post-office, and park mansion was a wretched imitation of a temple of Diana, often in stucco. We do not fly to the goddesses and erect such nondescript things now; what we do is very much more defensible and in advance of all that. There are other indications of progress in art, such as the revival of terra-cotta. This country is, I believe, at the head of Europe in the use of plastic material for utility. The French are behind us; both Germans and Italians are, I consider, inferior in the use of plastic art. Then in the matter of stained glass, nobody can go into a church or chapel without seeing the immense advance in the making of stained glass; compare the windows painted after Sir Joshua Reynolds at Oxford with those now produced; almost every church and chapel, even Nonconformist, has now a jewelled window, and English glass, I venture to say, is more consistent with true principles of decoration than French or German glass. In furniture (especially for the million) also there has been great improvement; some eighty years ago you might have got a solitary piece of fine furniture made by Chippendale in England, or Goutière in France, but then you had to pay exorbitantly for them. In woven fabrics of all kinds, in pottery of all kinds, I think England may be placed ahead of the world. It is true that England does not commission our first artists to paint or model costly vases, as France and Germany do, but we could do it if we liked. In Paris a great artist may receive, at Sèvres, a commission for a vase to be given to an ambassador, but there the solitary thing ends. This is not our way of doing business; it is not the fashion here to urge the Government to order such works of art, but we could produce masterpieces if we commissioned Leighton, or Poynter, Walter Crane, or Moore to work; Minton and other makers of pottery are unrivalled for all classes of artistic productions made at commercial risks to be sold. Mr. Sparkes, who is attached to the Art Training School, has revived, or re-invented, a pottery known as Doulton's ware, which is much worked by women. I leave this subject by saying that in the Paris Exhibition of 1867, various kinds of British goods of a decorative nature were shown,—works in terra-cotta, majolica, bronze, mosaics of all kinds,—and competent judges declared emphatically that they were the finest things of the kind in the Exhibition. The next Paris Exhibition ought to show still further cause for gratulation in the display of English specimens of art applied to industry. The problem we have before us is how to utilise fine-art power and give it a decorative influence; how to unite the artist and the workman so as to gratify, not one person, but millions. I maintain that this is being done, and done successfully. Aristotle says of possessions:—"Those rather are useful which bear fruit; those liberal which tend to enjoyment." By "useful," he means, which yield revenue; by "enjoyment," that which proves of consequence beyond the using. Now, the possession of fine-art power and able handicraft is both useful and liberal, and it bears the fruits of both in money and enjoyment.

System pursued in our Fine-Art Schools.

Well, fine-art culture is taught in schools and museums, and the results of the system are shown in shop-windows and in our annual exhibitions, local and metropolitan. To those who decry our system,—and there are, perhaps, some three or four clever, cranky prophets who do it,—I may say that almost every European nation, including France itself, has adopted it; so have the United States, as well as our colonies. The system was partially started years ago by William Dyce in his excellent drawing-book, from which everybody can learn to draw. The system was methodised and extended by my colleague, Mr. Richard Redgrave, who, I venture to say, has not yet received from this country that recognition that he well deserves for his labours. His views of fine-art were catholic; he had a universal appreciation of beauty. He was no pedant who stuck to one method of working only for realising beautiful thoughts and feelings, and despised all others; he recognised the value of all styles and methods of drawing and painting; he fully appreciated the different cunning special ways in which Leonardo da Vinci, Mantegna, Albert Dürer, Raffaelle, Holbein, Michelangelo, Titian, Ostade, Gainsborough, Mulready, Meissonier, and many others worked. He did not say that any modern French method was alone to be followed, or was better than the German; or that the German was better than the Italian. He knew that mere size in execution was not necessary to develop genius, as poor Haydon thought. A Greek gem to him of the size of a barleycorn might be as fine as the Venus de Milo, 8 ft. high. He laid down no pedantic rules against vehicles, or enjoined a particular touch of the brush; or prescribed dogmas about lines or points, stippling or scumbling. He said, "Use any method that enables you to work best." He said, "Take beauty as your pole-star wherever you find it." Now that, in my opinion, is the true course for anybody to pursue who wishes to encourage art-culture in this country. You may go and look at the pictures and statues of the great masters, but do not try merely to imitate them. The teacher's duty is to make his pupils thoroughly catholic in taste and aspiration, and not to tell them to copy this or that painter's style or modeller's touch. The works of great artists are like flowers of nature, you may cull sweetness and beauty, and perfume and delight, from all of them.

Practical Effects of the Fine Art System.

Now, what has been the practical effect of this system? In regard to Manchester, there was a school of design here in 1851; and I may say, by the way, that from our ignorance of the French language at that time, we did not know that the *Ecoles des Dessin* of France simply meant drawing-schools; so we called our first schools (promoted chiefly by Mr. Ewart and Mr. Poulett Thompson) by the grand name of "Schools of Design"; and, so to speak, we started upon the wrong rails, leading our manufacturers to think the State was going to provide them with designs or patterns. In 1851 Manchester had a school of design with 250 students, paying 256*l.* in fees. In 1876, the students of the present school of art, which took the place of the school of design, had increased to 429, and the fees to 961*l.* In addition to that, you have now a second school of art at the grammar-school, which has 838 students, paying 549*l.* fees. Besides these, you have 586 students in small art-schools throughout the town, in night-classes, where the elements of drawing are taught; and you have also 7,129 children learning drawing in elementary schools. In 1851 the State paid 600*l.* a-year to help drawing, being at the rate of more than 2*l.* a student. Now the State contributes nearly 1,400*l.* a-year, or at the rate of only 2s. 2d. a student; whilst the public itself, through this impulse, is doing and paying five times what it did in 1851. I have no doubt that, with the activity of your committee, and the feeling for art which has taken root and is evidently growing in Manchester, you will soon double these present numbers.

General Results of the Art System.

A few words on what is being done throughout the country. In 1851 there were seventeen schools of design, which have now increased to 141 schools of art. I hope the young men present will, in twenty-five years, see them increase to 500; and I think they will, if Parliament will only give the people the right to spend their own money in supporting them. They have the right to the extent of raising a penny in the pound at present, but this is like dancing the hornpipe in fetters; they are not to be trusted to spend 1½d. or 2d., or more. These 141 schools have 27,900 students; 883 night schools have 31,000 students; and there are nearly 4,000 elementary schools with 460,961 students. I have no doubt that before a long time has passed, the whole of the two million children who are now in elementary schools will learn to draw a little, at the same time that they learn to write, and with great advantage to their future occupations and refinements.

Museums: their Uses, and Necessity of Them.

Now I come to another subject,—that of museums. Mr. Poynter, amidst his several fallacies, said one or two true things about museums. Whatever errors and "risks" there might be about schools of art, he admitted that by means of museums "the truest principles of taste may be diffused among all classes." At a recent banquet in Manchester I ventured to express a conviction I hold strongly,—that it will be impossible to have a museum worthy of a population of 500,000 people, and in the neighbourhood of millions, unless you get the assistance of the Corporation. Of course, benevolent people will subscribe their money, but it will not be sufficient to do the work properly. A museum is a thing that must be liberally endowed, like a school or university, and even more liberally. Where would Oxford, and Cambridge, and Edinburgh, and Dublin, be without their endowments? The best chance of success you have here in Manchester is to go heartily with the people themselves, and teach them to be willing to pay for it. You might just as well talk of establishing a British Museum, or a Kensington Museum, or Owen's College, by eleemosynary assistance only, as a Manchester Museum worthy of the name. A museum is a sort of thing so above the ordinary appreciation of the great body of the people at present, that if you do not find secure and permanent funds to pay for it you will never get a proper museum. I venture to think that all your forces will have to be united. The school of art will have to enlist the sympathies of its constituency. I feel sure that members of the Corporation are sensitively alive to the votes of

their constituents, and the appreciation of their fellow townsmen. The work which the committee of the school of art have before you, is to hold meetings in every ward in this city, to teach the people what the school of art is, and what the art-gallery should be, and then to send petitions to the Corporation. I am sure the ex-Mayor, now present, judging by his looks, will be right glad to present and support them. This will be a piece of hard work, but you are responsible before Manchester to do it, you have taken good steps, and you must follow them up with the Corporation. The work will take you away from your business; it will tax your pockets as well as your time; and you may feel a little weaker physically after the work than you did before, but you will have the proud satisfaction of knowing that you have established an art museum in Manchester for the prosperity of the city and its district. I am happy to find that the work has been begun in Manchester, although in a very modest way, by means of the rates. I find from a return to Parliament that Manchester already has a museum supported by the rates; I was not aware of that till lately. Well, the Corporation having begun the work, you have only to give them a help on, and in time the Corporation will make it what it ought to be; I learn that the corporate authorities of Manchester opened a museum in Campfield in 1851; and this authentic Parliamentary document tells me that it was removed in 1864 to Queen's Park, wherever that may be. Go to Nottingham and see what that town is doing for a museum! The Corporation has obtained a private Act, and, assisted by a private subscription of about 20,000*l.*, it will have in six months the finest municipal museum in the Midland Counties. Urge the Corporation to get its Act,—to get permission from the Local Government Board to raise a loan if need be. Apply to the Lord President to obtain a public Act of Parliament, authorising the levy of rates for all purposes of science and art as freely as for primary education. You must allow me to go into the doctrine a little of the museums, which teach the student what the world has done before him; and unless you know the antecedents of fine things you flounder about in ignorance and waste time. A museum of art is absolutely necessary to the student, if he is to be well trained and educated; but it is most important to the public. The grown public are not children to go to a school of art, but will flock to museums, especially after church on Sundays, if they are made comfortable, well-ventilated, and warmed, well located, and with a little music in the evening occasionally: and thus they will be taught in a way that no other process of education will do. And then there is the great advantage of such training of taste in a commercial point of view; you create consumers for your art products, and the work, whilst proving beneficial not only to students of art, will wean millions from the devil's temptations in the beershops.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AT the ordinary general meeting of this Institute on Monday evening last, Mr. Charles Barry, president, in the chair, the following gentlemen were balloted for and duly elected, viz.:—As Fellows: Mr. H. Jarvis, jun., and Mr. Thomas Verity. As Associates: Mr. A. T. Taylor, Mr. C. H. Purday, and Mr. W. H. Arber. As Honorary Associate: The Right Hon. G. Cavendish Bentinck, M.P. As Honorary Fellow: Mr. John T. Wood,—well known as the discoverer of the Temple of Diana at Ephesus.

Death of Mr. Joseph Bonomi.—Professor Donaldson said it was his sad duty to have to announce the death, early on Sunday morning, of Mr. Joseph Bonomi, the learned curator of Sir John Soane's Museum, who was most highly respected, not only for his attainments, but for his courtesy and kindness to all. As an officer of the Trustees of Sir John Soane's Museum he was most trustworthy and assiduous in the discharge of his duties, and was always to be found at his post until quite lately, when his illness had prevented his attendance. The Trustees had the fullest confidence in him, and in carrying out the arrangements for the proper care of the Museum, it was but right to say that he was ably seconded by Miss Martin, his sister-in-law, and daughter of the celebrated John Martin. Mr. Bonomi's character was well known, and he (Prof. Donaldson) could only bear testimony to the respect in which he was held by all who knew him. He was profoundly read in Egyptian antiquities.

The President said he was sure the meeting had heard the announcement just made with great regret. Mr. Bonomi had passed a long life, and had done a large amount of valuable work,—work that would always be highly appreciated.

Foreign Correspondence.—Mr. F. P. Cockerell, hon. sec. for Foreign Correspondence, said he had received a number of letters in response to the circular letter which, in accordance with annual custom, he had this year sent to the foreign members of the Institute. Amongst them were letters from the Cavaliere Fiorelli, Rome, offering facilities to students for visiting antiquities and museums, of which he is Director-General; from M. Lucas, secretary of the Société Centrale, Paris, announcing programme of International Congress of 1878; from M. L. J. Duc, indicating names of rising French architects who might be elected honorary and corresponding members of the Institute; from M. Morey, giving some notice of extensive works in the town of Nancy; from M. Coste, giving some account of schools at Marseilles; from Signor Poggi, announcing the death of Signor Alvino, of Naples; from Signor Selvatico, describing some interesting public works and improvements in Padua; and from Professor Meldahl, of Copenhagen; and M. Delsaux, of Brussels. Professor Meldahl's letter announced a work on Fredericksborg (presented at the last meeting of the Institute). The plates show parts restored by Professor Meldahl after the fire of 1859. Future additions to the work are promised. The Professor adverts to the supposed authorship of the Castle by Inigo Jones, and considers that he cannot be so. The plan is that of French châteaux. The façade is in the style prevalent in Holland and North-West Germany in the sixteenth and seventeenth centuries. Professor Meldahl considers form and details to be the work of a dilettante, perhaps of the King, Christian IV., to whom Inigo Jones may have given the plan after his (Inigo's) tour in France. Professor Meldahl promises further on the subject; also on the Castles of Kronberg and Elsinore,—the latter much like Scotch castles. The architect of Kronberg was probably Antony Obberger, who at the close of the sixteenth century went to Danzig, as architect to the city. He was a great artist little known. The letter from M. Delsaux (Brussels) expressed regret at the decline of art in Belgium, notwithstanding a great impulse in building. He laid the blame on the public press, and upon the great rapidity with which building is now executed. He considered that luxury and mechanical contrivances overstrained the population, and wore them out. He complained of the great height of private buildings, and of the extravagant extent of ecclesiastical corporation buildings. He expressed a strong desire for sumptuary laws limiting the waste of coal, and thought that gas-lighting should be limited, as God had not given daylight to be superseded.

Professor Donaldson said it appeared to him that some of these communications were very important, and contained a great deal of valuable information, and he ventured to suggest whether it would not be advisable, at the discretion of Mr. Cockerell and by the consent of the Council, to print these communications, or portions of them, in the "Transactions" of the Institute? They were likely to be of much utility and interest, and it was only due to the writers, who were at considerable trouble to send the information, that the Institute should show its appreciation of their kindness in this way.

The President said it had been in contemplation to do what had just been suggested, and after the favourable expression of opinion which the Professor's suggestion had called forth, he was quite sure that the Council would accede to the request.

Mr. Wyatt Papworth said that in reference to the Castle of Fredericksborg, it was found after the fire that the Government did not possess any drawings or engravings of the building. It was remembered, perhaps, by Mr. Hansen, the architect, that some few years before the fire an English architect, named Edward Falkener, who would be well-known to many in that room, had made complete drawings of the building, externally and internally. He was inquired after, and upon being communicated with he placed the whole of his drawings at the disposal of the Government. The King was, of course, greatly pleased, and sent him in return one of the orders at his disposal.

The Secretaryship.—The President said that at the last meeting of the Institute candidates for the secretaryship had been requested to send in their names on or before that day (Monday), which was to have been a special meeting, and to which the Council had hoped to have been able to place a name before the general body for approval. Considering, however, how very important the appointment was, and how very much it would affect for good or ill the future success and well-being of the Institute, it was advisable not to be in too great a hurry, and hence it had been determined to postpone the special meeting until Monday, the 18th inst., up to which date the names of candidates would be received. The Council had additional cause for postponement in the fact that they had received a requisition from eight Fellows of the Institute asking them to convene a special meeting to consider the advisability of having the secretarial work of the Institute done by two honorary secretaries, responsible for the performance of the work, but assisted by a paid officer, not necessarily a member of the Institute. The Council had therefore to announce that the special meeting in pursuance of the requisition would be held on the 18th inst. The Council also announced that the schedule of duties already issued to those who had applied for it was an imperfect document, and before the election it might possibly be amended or added to. He might add that Mr. Eastlake, with characteristic courtesy, had agreed to attend all ordinary or Council meetings so long as the Council thought he could be of any assistance.

City Churches.—Mr. Hebb said that some years ago a committee was appointed by the Institute for the Conservation of Ancient Monuments. From time to time, in the annual report, reference had been made to the work of the Committee, but he wished to ask whether the Council had any objection to state what had been the result of the labours of the Committee with regard to a large number of City churches which were threatened with destruction? He was aware that the Committee had made some progress in the matter, and had begun to collect a number of drawings of these churches, but he should like to have some further information.

Mr. Eastlake, in reply, said that some time ago a paper was prepared by some members of the Conservation Committee, and read before the Institute,* giving detailed information on some of the condemned City churches. That, however, was not the whole of the information which had been collected by the Committee; other notes were ready, notably some by Mr. E. B. Ferrey, but owing to the crowded state of the syllabus of papers this session, they could not be read. They would, however, be available for next session.

Mr. Horace Jones congratulated the Institute on having that evening elected as Honorary Associate the Right Hon. G. Cavendish-Bentinck, who some years ago was mainly successful in preserving the tower of the church of St. Mary Somerset, Thames-street.

The President announced that the Committee appointed by the Council had still under their consideration the Bill which had been brought in by the Metropolitan Board of Works for the amendment of the Metropolitan Building Act. He had hoped that the committee would have been able to present a report on the subject, but this was not yet possible, owing to the modifications and amendments which the Board had been making in the draft of the Bill. The subject was not being lost sight of, however, and it might be mentioned that the relations subsisting between the Institute and the Board continued to be of the most friendly character.

Mr. T. Roger Smith then read the paper by Mr. Josiah Conder on Japanese Architecture, of which we give a portion on another page.

Workmen's Club, Penn, Bucks.—A new block of buildings, to cost about 600*l.*, is in course of erection at this picturesque village, intended for a workmen's club and caretaker's house. The accommodation will include reading and news rooms, smoking-room, and other conveniences. The building is of brick and flint, with tiled roofs, in the Early Domestic English style, and the total cost has been sustained by Sir Philip Rose, bart., the High Sheriff of Bucks. The works are being executed by Mr. Z. Wheeler, of Penn. Mr. Arthur Vernon is the architect.

* The substance of this paper was given in the *Builder* last year (vol. xxxv., p. 403).

THE LATE JOSEPH BONOMI.

ON Sunday last, at two o'clock, there passed away from among us a man who has long had his name associated with the architecture, sculptures, and hieroglyphics of the ancient land of the Pharaohs. The reputation of Joseph Bonomi has been long connected with these subjects, for a long lease of life had been granted to him. He was in his eighty-second year. His father had been architect of St. Peter's, Rome; but at the request of the brothers James and Robert Adam, the architects, he came to England and was employed by them for many years. He subsequently built some very noteworthy structures in England and Scotland, such as the Sardinian Chapel and Montague House in London; Eastwell House, the present owner of which is the Duke of Edinburgh; and Roseneath, on the Clyde, belonging to the Duke of Argyle. From this it will be seen that Mr. Bonomi's first breathings would be in an atmosphere of architecture and art. This is further evident from the fact that Angelica Kauffman and Maria Cosway were sponsors at the baptism of the infant and his twin sister, who were born on the 9th of October, 1796, which event occurred at 76, Great Titchfield-street, Marylebone. The father and mother were Roman Catholics, so the baptism took place in the Venetian Chapel. It may also be worthy of noting that the father was an intimate friend of Sir Joshua Reynolds, and it was the refusal of the Royal Academy to confer on him the honour of the R.A.-ship which led to Sir Joshua's rupture with that body.

Mr. Bonomi was chiefly educated in a school at Carshalton, Surrey, and then became a student at the Royal Academy, where he gained the silver medal for the best drawing from the antique, and also the best model from the same. After this he entered the studio of Nollekens, the sculptor, as that was the branch of art he had selected to follow. In 1823 he went to Rome, in order to prosecute his studies, and while there he formed an intimate acquaintance with John Gibson.

A gentleman, named Robert Hay, a naval officer, on a visit to Naples, came to Rome. He was a clever sketcher, and had a desire to do something in Egypt, and he was trying among the students to induce some of them to accompany him; but Bonomi was the only one that offered himself, and it was agreed that he would go, even although the remuneration which had been promised was small. This acquaintanceship was thus the turning-point in Bonomi's life, and affected the whole course of his after-studies in art. It was in 1824 that he left Italy, with Hay, for Egypt. Perhaps it should be mentioned that the most important of the objects in the collection which they formed were bought by the British Museum. Ultimately Mr. Hay left Egypt, but Bonomi remained. It is evident that he had taken a liking to the country and its people. He had adopted the Arab dress, and assimilated himself to their modes of life. He soon learned their language, and kept his donkey for riding about, after the custom of the country, and he learned to adapt himself to every condition of existence among the modern Egyptians. In one of the diaries which he kept there is mention of his coming to a halt in one of the towns on his route, and finding a quiet spot, he turned into it with his donkey and camel, and had his food in the street, where he also made his bed for the night. There was one great advantage he derived from these habits,—he was by them able to exist at a very small cost, and thus could, on his then limited means, carry on his studies in the field he had thus selected. He remained eight years in Egypt at this time, during which he was brought into contact with men of all kinds, who came to travel on the Nile; for Bonomi's experiences were of value to travellers. Among the acquaintances he formed was that of the Duke of Northumberland. When Mr. Bonomi returned to England he paid a visit to Alnwick. At this place he seems to have gone about at times in his Arab costume, and one day he was accosted by the manager of a travelling circus, who offered him an engagement, and he would be announced as "the Bounding Bedouin of the Desert," or some similarly-sounding phrase, such as caterers for the entertainment of the public delight in. Bonomi wrought at the hieroglyphics for some of the time with Mr. James Burton, and they even reproduced some of them by means of lithography in Cairo.

It was in 1833 that he made a slight change in the field of his work. In that year he went to Jerusalem with Messrs. Catherwood & Arundale. There was then a great risk in a European entering the Haram enclosure, for the Mahomedans might, on the slightest pretext, assault and murder an infidel for venturing into their holy places. Bonomi's Arab outfit, and familiarity with customs, enabled him to go in with comparative safety. This was the first time that correct drawings and details of the Mosque of Omar and the El-Aksa were taken; and it forms an important event, for it was upon these drawings that Mr. Fergusson founded his celebrated "Architectural Argument" in relation to the true site of the Holy Sepulchre. He also visited Sinai, as well as Damascus and Baalbek at this time.

After this he returned to England, and was at work making drawings of hieroglyphics in connexion with works on Egypt. He illustrated some work for Sir Gardner Wilkinson, and, along with Arundale, he made drawings for a work in which Dr. Birch did the literary part of it, called the "Gallery of Antiquities." This was in 1841.

In 1842 he was engaged to accompany the expedition which was sent out by the King of Prussia under Lepsius. This resulted from meeting at the British Museum the king, Fred. William IV. of Prussia, Alex. V. Humboldt, Bunsen, and Lepsius. The advantages to the expedition to be derived from Mr. Bonomi's long experience in Egypt, as well as from his artistic powers, were too palpable, and they induced him to go; and as the expedition was just starting he had to get ready in two days. It left Southampton on the 1st of September of that year. They had a dinner in the hotel before going on board, and Bunsen accompanied them to the ship to say good-bye. Mr. Bonomi had engaged himself for six months, but he did not return till 1844, thus gaining renewed experience of Egypt and its monuments. In 1845 he married one of the daughters of John Martin, the celebrated painter.

Shortly after this he was engaged working with Messrs. Warren & Fahey, the well-known water-colour artists, at "A Panoramic Picture of the Nile." The catalogue states "from drawings made by Joseph Bonomi." It was appropriately enough exhibited in the "Egyptian Hall, Piccadilly," in 1849. In 1853 he was at work with Owen Jones at the Egyptian Court of the Crystal Palace, where the figures and the hieroglyphics bear the evident mark of Mr. Bonomi's touch.

In 1861 Mr. Bonomi was elected curator to Sir John Soane's Museum in Lincoln's-inn-fields, the duties of which he has carried out till his death. His appointment to this office led to one very important work being done; that was the reproduction of all the hieroglyphics on the Belzoni Sarcophagus, which is one of the treasures of that museum, it being at the same time the most important monument of that kind which has yet been found in Egypt. It belonged to Oimenepthah I., and is of alabaster, and entirely covered outside as well as inside with hieroglyphics. By means of the work published by Bonomi, scholars are able to study these, and it has led to their having been interpreted, and a work on the subject was lately announced. The matter of the hieroglyphics is that of the funeral ritual, a point of study which has lately assumed considerable interest in connexion with Egyptology. The letterpress which accompanies this work was written by Mr. Samuel Sharpe, the celebrated Egyptologist, and who has been a *collaborateur* with Bonomi in many works.

It would be difficult to give a complete list of all the works Mr. Bonomi produced. Papers by him will be found in the Transactions of the Royal Society of Literature, Syro-Egyptian Society and its successor the Society of Biblical Archæology, British Association, &c. He was also a frequent contributor to the magazines, and many contributions, some of them small but valuable, will be found in the pages of the *Literary Gazette*, *Athenæum*, *Illustrated London News*, and the *Builder*, in whose pages some important communications by him appeared lately in reference to Cleopatra's needle and its proposed sites. He suggested long ago the propriety of getting casts made in bronze, of one of the best of the Roman obelisks, such as the one at St. John Lateran, and setting it up in London, to serve the purpose of a monument, and at the same time to give the public some notion of these ancient monuments, and of the hieroglyphics upon them. One of his works was a small text-book on the "Proportion of the Human Figure," a subject which his study as a sculptor no doubt led him into; but it also was the means of his inventing a machine for measuring the human body, by which the height of the person and length of the arms were simultaneously taken. This he was anxious for the army to adopt, and he urged it on the prison authorities as a means of identification. He often affirmed that if his machine had been in use in the army, and the young Sir Roger Tichborne had been operated upon when in the dragoons, the case of the Claimant would have been an impossibility.

The very varied experience which Mr. Bonomi had of Egypt, an experience of modern Egyptians learned during his long residence, and his knowledge of the ancient Egyptians, resulting from his drawing the monuments, was a very valuable acquisition, as all knew who had the advantage of Bonomi's acquaintance. He might be described as a Book of Reference in all things Egyptian, and a book whose value will be felt now that it is lost. It was always an open book to any one who wanted information. All who have ever met Mr. Bonomi will be able to bear out the statement as to the willingness he always manifested to answer questions and supply information to all who desired it. He did it, too, without fuss or vanity. He was not one who indulged in useless exhibition of his knowledge. His only desire seemed always to throw light on the matter which was brought before him. His power of drawing hieroglyphics has never been surpassed. All artists feel the difficulty of representing Egyptian figures, with the necessary absence of muscular development about the calves of the legs. This Mr. Bonomi, by his long experience, had learned to give with the greatest facility, but, then, he had a very true eye and a delicate hand to guide his pencil. Amongst his papers left are a great number of sketch-books full of hieroglyphics, and also valuable written notes. The hope ought to be expressed that something should be done to place such valuable gleanings within the reach of all who are interested in them.

THE LARGEST GASOMETER IN THE WORLD.

IN connexion with the gas works near the Oval, Kennington, an immense new gasometer is at present in course of construction. The attention of the Lambeth Vestry was called to the structure, at their meeting last week, when Mr. Cox described it as "an erection of a most fearful character," which would be sure to be detrimental to the property surrounding it. It would block up the view, and interfere with the free current of air, and under these circumstances, he wished to know if the Vestry had any power to interfere with the "huge monster" which was being put up. The Chairman, Mr. Burrap, observed that it was the largest gasometer in the world. In reply to Mr. Cox's inquiry, the surveyor said he did not think there was any power to interfere, and that certainly the opportunity of interfering was now very doubtful, inasmuch as many thousands of pounds had been spent on the structure, which was now approaching completion.

Cement.—At the last annual meeting of the Central Association of Master Builders some communications were referred to which had been made with the lime and cement merchants, with a view to obtaining a more uniform standard of measurement, and it was finally arranged that in future the standard should be by weight instead of measure.

Ripley Public Buildings. — Seventeen architects sent in designs. At the last meeting of the Local Board the Committee had reduced the competitors to four, namely, Messrs. Trueman & Pratt, of Nottingham; Mr. A. Smith, Nottingham; Messrs. Giles & Brookhouse, Derby; and Messrs. Tait & Langham, of Leicester; but as they could not determine which of the two latter to place the first, they had sought the opinion of the engineer, whose report was read. Mr. Argile said both the designs were so excellent that he had written his report. He first pointed out, in his opinion, the excellences of Messrs. Giles & Brookhouse's in some nine particulars, and then the excellences of Messrs. Tait & Langham's in some eleven particulars, and finally declared, in his opinion, for the purposes of the Board, the latter was the best. The plans of Messrs. Tait & Langham were adopted.

THE FALL OF BUILDINGS IN THE HAYMARKET.

As briefly stated in our last, the adjourned inquest into the cause of the death of Mr. William Baron was resumed on the 27th ult., before Mr. St. Clair Bedford, coroner for Westminster. The body of the deceased, as will be remembered, was found beneath the *débris* of his premises, which, together with a new building adjoining, fell in on the 17th of January.

Mr. W. Wyke Smith watched the case on behalf of the Metropolitan Board of Works; Mr. N. Bazalgette represented the District Surveyor (Mr. Robert Walker); Mr. Poland appeared on behalf of Messrs. Newman & Mann, the builders; Mr. McColl represented the interests of the relatives of the deceased; Mr. E. Clarke appeared for the architect, Mr. W. Wimble, and the building owner; the Hon. J. De Grey for the owners of the house in which deceased lived; and Mr. Reid for Messrs. Shaw & Co., who supplied the iron work.

Mr. George Vulliamy, superintending architect, Metropolitan Board of Works, was the first witness called. He deposed that he had carefully inspected the *débris* of the fallen buildings, both before and after they had been partially cleared away, and during the progress of the clearing, but he was unable, as the result of such examination, to determine what was the cause of the accident. From what he could see of the foundations, so far as they were opened, they were altogether proper and right. He thought he had seen enough to determine his mind on that point. Before giving any further opinion he would like to hear the witnesses that were to be called, and he would be pleased to give his opinion on anything that might be asked him.

Mr. Robert Walker said he was district surveyor of St. Martin's-in-the-Fields, and that on September 26th last he received notice that Messrs. Newman & Mann had commenced on September 1st, a building at 24, Haymarket (the corner of Panton-street). Previously to that, on September 18th, he had visited the site and found the works were going on, no notice having been given. At that time the "underpinning" of the south party-wall (*i.e.*, the wall between the new building and Mr. Baron's house) was nearly completed. On the 26th (the day the notice was given) he again visited the works and saw the foreman. He then saw the foundations and concrete, which were of a first-class description. Since then he had seen the work from time to time, the last being about three or four days before the houses fell. During the progress of the building he had not observed anything to object to. He saw the plans of the building, which were on the works. They were the general plans of the different floors. He looked at them and there was nothing that required comment. So far as the buildings were carried out up to the time of the accident, the materials appeared to be of a good description, and there was nothing to strike him, as a district surveyor, as being wrong. The party-wall appeared to be a substantial wall, and not one which he should have condemned. He certainly considered it was strong enough to bear the weight of the new building that would be put on it. Like Mr. Vulliamy, he would not give any opinion as to the cause of the accident till he had heard the evidence. Some of the materials were very good, but the cast-iron columns were the worst he ever saw. The circular girder at the corner was of wrought-iron; the straight girders were also made of wrought-iron. He did not think the circular girder was put together in a workmanlike manner.

John Sweetland, general foreman of the new building up to December 29, said that when he left it, the building was ready to receive the roof.

The Coroner: During your foremanship did anything strike you as dangerous in the construction of the building?

Witness: Well, I thought it rather funny that they should leave the old wall and build on the top of it. The state of the brickwork was like a piece of sponge.

Asked whether he made any complaint about this, the witness said he spoke to Mr. Kellow, the clerk of works, several times. To the best of his recollection, Mr. Kellow made no reply at all, or else said, "We must allow some one else to know as well as we do." The old wall was takendown to the first-floor level, and the new one built on the top of it, under the direction of the architect and the clerk of works. About 22 ft. in height of the old wall remained. The height of the new wall put upon it at the first commencement was about 25 ft. The whole height of the new wall on the top of the old one was 46 ft. 6 in. The thickness of the new wall was 14 in.

Asked whether there was anything else that struck him besides the alleged bad state of the old wall, the witness replied: "It looked very funny to see the building standing on stilts." He explained that by stilts he meant columns.

Asked whether he could account for the falling of the house, he said it was his firm belief that if the old wall had been renewed throughout the building would have been still standing.

In reply to further questions, he said he assisted to take out the foundation. Some portions of it were good sound gravel, but others not. There were seven pier holes. Where the columns stood concrete was put in. From 25 ft. to 30 ft. in length of the old wall was left standing. He superintended the underpinning of the old wall; it was properly done in lengths of 3 ft. The wall was being raised simultaneously with the underpinning. The iron girders were put up by him. There was a detail drawing for the circular girder, and he put it up according to that drawing. It was put up in a proper and workmanlike manner. He thought the plan of the girder was a safe one. He did not superintend the bolting or riveting; that was done by Messrs. Shaw, who furnished the girder. Complaints were made by Mr. Baron that the doors in his house could not be shut; that was after the wall was rebuilt. He sent a carpenter in to ease the doors. He had been to the place since the building fell. He saw that several of the bolts of the circular girder were gone. There was no particular weight over the circular girder. There were window-openings all the way up. He had never been engaged on any building in which a circular girder had been fixed in the way indicated.

Charles L. Gooch said he succeeded the last witness as foreman on the new building on the 31st December. The roof was not then on. The party-wall in the Haymarket front was finished. Nothing struck him about the work as being of an improper or dangerous character. He continued foreman till the building fell. On the afternoon of the day that it fell a complaint was made that the front door of the next house would not close. He sent a carpenter to see to it. Witness, Mr. Wimble, and Mr. Johnson (Mr. Wimble's assistant) went into Mr. Baron's house, and all over it. They saw nothing to attract their attention. There was a crack in the staircase wall of the other adjoining house in Panton-street, but he did not see that till the house had fallen. His attention was not particularly called to the old wall, which looked tolerably good. It was cut into by his direction when they were going to fix the stone staircase. Before he did it he sent for the clerk of the works, but as Mr. Kellow was ill, he (Gooch) sent to the yard for instructions. The height of the place cut away* was 6 ft. 9 in., and the width 7 ft. It was done a little before four o'clock in the afternoon of the day that the building fell. It was intended to fill it up with new work, and two-thirds of the new work had been got in before the men left work. He thought it was a wall to which that operation could be safely applied. It was cut with a hammer and chisel. He saw it after it was cut, ready to brick up, and he thought it safe. Mr. Wimble sent for him between three and four o'clock, and asked by whose authority the cutting away had been done. He (Gooch) replied that he had sent for the clerk of the works, and that he was ill, and that he then sent for and obtained instructions from the yard. Mr. Wimble said rather than have had the wall cut he would have carried up two piers to support two rolled iron joists upon which to carry a wall into which the stairs could be fitted. The wall was cut away for the purpose of carrying a stone staircase from the ground floor to the first floor. The wall was leaning out of the perpendicular where it was cut away. The wall was, in fact, 5 in. hollow, and it was necessary to make the wall plumb before the stairs could be fixed. He was not constantly on the works. He had another job to look after as well. There was no one in charge when he was away. Mr. Kellow, the clerk of the works was there two or three times a week. He represented the architect. He (Gooch) was not there the whole day on the 17th, when the wall was being cut out. The wall was cut out 4½ inches at the bottom, and 1½ in. at the top. He did not think that would weaken it much. They did it so as to make it, when filled up again, flush, and to get a bite for the steps. The filling-up would add strength to the wall when it was completed. It was done with cement. The filling-in would give no strength till the brickwork had set. Being in cement it would set in three or four days.

The inquiry was continued on the 1st inst., when the first witness examined was Mr. Robert Baron, brother of the deceased, who deposed that he had assisted his brother in his business, and was at his brother's house every day from the time the new building was commenced until it fell down On the Wednesday before the accident, he noticed that the street-door shut very easily. Upon several occasions previously the door had to be cut. On the Thursday afternoon, the day of the accident, the door suddenly stuck, and could not be opened. The deceased asked him to try and find the carpenter in the new buildings, who had eased the door on previous occasions. He (witness) went in at the further end of the building in Panton-street, and saw some men knocking at the party-wall between the new building and his brother's house. He asked what they were doing, and they said, "Making you strong." He could not see the carpenter, but afterwards Mr. Wimble and Mr. Johnson came and looked over his brother's house. They went up-stairs and looked at the walls, and afterwards ordered the foreman to send the carpenter to cut a piece off the door. When that was done, Mr. Wimble said that the place was all correct. The chief indication of anything being wrong was the moving of a sink in the kitchen. That was on the evening of the accident. The sink was just behind the place where he had seen the men cutting away the wall on the other side. The sink was only just fastened into the wall, and rested on two brick piers; it appeared to sink where it was let into the wall, and to lift up in the front. One of the flagstones in the kitchen had been dropping on one side and rising on the other for about six weeks.

Mr. Wm. Wimble, the architect of the building, was the next witness examined.—He said that he was architect for the new building in the Haymarket which had fallen; he was employed by his client, Mr. G. M. Hughes. The building was intended for shops on the ground floors and residential chambers on the upper floors. In the design of the building he had paid careful attention to the weights that each part of the structure was to carry. It was usual to pay particular attention to the party-walls of buildings of this class, and for the architect to put himself in communication with the owners of the adjoining property. In accordance with the requirements of the Building Act, he served a notice upon the representatives of the owners of No. 23, and also upon the occupant, Mr. Baron. He was afterwards put into communication with Mr. J. T. Wimperis, a surveyor, who acted as surveyor on behalf of the freeholder of the old building, and for Mr. Baron, in respect to the party-wall. He and Mr. Wimperis examined most carefully the condition of the party-wall. After a consultation with Mr. Wimperis in July, it was resolved to take down the party-wall of the old house to the second-floor level. In July an agreement was signed by him and Mr. Wimperis nominating Mr. Robert Hesketh as surveyor to act as referee in case of any dispute arising between them on the matter, but no dispute arose. Subsequently it was agreed that more of the party-wall should be taken down. It was consequently taken down to about the level of the first-floor joists of the new building. He was continually at the building watching its progress, and he never saw anything to lead him to doubt the sufficiency of the remaining portion of the old party-wall for the weight it was to carry. He examined the under-pinning while the work was going on. It rested on a sound gravel base. He had not before heard that one of the flagstones in Mr. Baron's kitchen had been sinking, but such a thing would possibly happen, as there was always a slight settlement after under-pinning. On the afternoon of the day on which the building fell he saw that a portion of the face of the wall had been cut away. Before that he had no idea that any part of the wall was going to be cut away. When he saw that the wall had been cut away, he said to Mr. Johnson, who was with him, "What are they up to here?" He asked the foreman who gave him the orders, and he said

* In our brief summary of this witness's evidence last week (p. 227), it was incorrectly stated that the wall had been "dubbed" out; it should have been "cut out."

he got them from the yard. He reprimanded the foreman in the severest terms, and expressed astonishment that the wall should have been cut into without directions from the architect. A bricklayer was at work, commencing to brick up the recess thus formed, and witness told him to do it as quickly as possible. He did not see that any mischief had been done at that time, but he was aware that the cutting must weaken the wall. About 8 ft. 6 in. in height was cut away (in the basement story), the width of the cutting being about 12 ft. 6 in. It was cut away to the depth of half a brick over the whole surface. The wall could not have been 3 in. out of the perpendicular in the height of 7 ft. without being noticed by himself or Mr. Wimperis seeing it. Upon leaving the new building on the afternoon of the accident, he met Mr. Baron, who told him that his front door required easing. He found that the door would not quite close, and he gave instructions that it should be eased. He looked at the front of Mr. Baron's house at the time, but could see no indication of danger. He had visited the premises many times since the accident, and after a careful examination of the old party-wall, he was still of opinion that it was sound and sufficient to carry the weight upon it had it been let alone. He attributed the fall of the building undoubtedly to the cutting away of the party-wall, a contributory cause being the defective quality of the ironwork. The cast-iron columns were utterly unfit to bear any extra strain. Most of them were full of holes, which were plugged with lead and wood, means having been taken to hide this plugging by means of a composition made perhaps of putty and steel filings, or something similar. The columns were specified to be 8 in. diameter, and of 1¼ in. metal. Instead of this they were not truly cylindrical internally, the metal being perhaps ¼ in. thick on one side with a corresponding excess on the opposite side, so that there would be 1¾ in. or 2 in. of metal on one side and only ¼ in. on the other. This was owing to improper casting. The iron girder on the Haymarket side would have to support about fifty tons. This girder rested at one end upon a stanchion let into and resting upon the party-wall between the new building and Mr. Baron's house, the stanchion being immediately supported upon a stone base, 1 ft. 7 in. by 9 in., and 9 in. deep. The weight upon the iron stanchion would have been about 18 tons. The stone base of the stanchion rested upon a piece of the old wall, and he did not think this an imprudent thing to do. The old wall was crushed all the way along. He did not think the accident was caused by the great weight upon the iron stanchion crushing the old wall upon which it rested, but by the cutting away of the wall. He had given no directions as to the manner in which the stone stairs were to be fixed in the old wall, as the original plans were for a new wall right through. He thought the plan of the building was perfectly correct, and he was not prepared to say that if he were to build the house again he would not build it in the same way. He had nothing to do with ordering the ironwork. The builders ordered it.

The inquest was continued on Wednesday last, when the first witness called was

Mr. John Thomas Wimperis, of Sackville-street, Piccadilly, architect and surveyor, who said he had had considerable experience in building and surveying matters. In June last he received a letter from the solicitors to the owner of Mr. Baron's house, requesting him to survey the party-wall and attend to the notice. He saw Mr. Wimble, the architect, who submitted his plans. He took particular notice of the party-wall. They both considered that it was a very decent party-wall. It was first agreed to take down the gable and top story, and then to strip the wall for examination. This was done. The wall was stripped on the north side, and Mr. Wimble said he thought it would perhaps be as well to take it down a little lower. He (Mr. Wimperis) said, "Take it down as far as you think necessary." He believed it was afterwards taken down lower. The state of the old party-wall seemed to be very good, and quite sufficient for the weight it would have to carry. It was such a wall as he should have kept up himself. He passed the building at six o'clock on the evening of the accident. Did not go in, but saw nothing wrong. Never heard of the cutting away of the wall until he heard the evidence. He thought that was very injudicious without first putting in a lintel or arch to support the wall above. He did not suppose that had the ironwork been sound the cutting away of the wall would have been sufficient to cause the accident. He had examined the ironwork very carefully, and observed that the casting of the columns was very irregular, and made up with lead poured into the bad portions. He examined the iron circular girder, and found that it was attached to the long girders with rather short plates at the sides, and, he believed, a plate on the top. The side-plates were bolted on to the web of the girder. He saw that several bolts were missing, and those that were in did not seem to be put in in a proper workmanlike manner. Some of the holes did not seem to have come together, and he should say they never had any bolts in. It was impossible that the holes should have got out of correspondence with each other owing to the accident. He believed that the side-plates were of malleable iron. From what he observed, it struck him that the circular girder was the cause of the accident, from the imperfect way in which it was connected with the straight girders. The effect of the circular girder giving way would be to break the cast-iron columns. The cutting of the wall might have contributed to the accident. Would not undertake to say, with certainty, whether the wall commenced to move before the ironwork; but, in his opinion, the ironwork was the first moving cause. In his opinion, the old wall was not 5 in. out of perpendicular, but would not undertake to swear that it was not. It was not usual to plumb old party walls. Did not know the weight put upon the old wall. Knew that the old party-wall had been cut away, and that the stanchion for the girder rested on it. Should not have done that himself; it was an injudicious thing to do. The sticking or tightening of Mr. Baron's doors would not necessarily be a sign of danger. Slight settlements were usual in such cases. Did not know that every column in the basement was unfractured. It was not usual to cut into old party-walls to insert steps. He should not do it. If he were to rebuild the place to-morrow he would leave the old party-wall up, but without the stanchion. He took no measurements of the circular girder; made no calculations. On the west side the circular girder was still attached to the horizontal one. His opinion was that the weight at the corner pressed the circular girder over, and then the moment there was an extra pressure upon the columns they broke. Did not know that the old party-wall had been crushed.

A Juror.—If the corner gave way, would not the building have fallen outwards, instead of inwards?

Witness.—It would have fallen outwards at the corner, but inwards at the two sides.

Robert Rose, carpenter, employed by Messrs. Newman & Mann, said that after the old wall was partially pulled down he plumbed it with Sweetland, the foreman, and it was found to be 5 in. out. Mr. Kellow, clerk of the works, was present. He (Rose) eased the door of Mr. Baron's shop three different times. The sinking of the story-post caused the door to sink. The height of wall plumbed was 22 ft., *i.e.*, from the level of the first-floor of the new building to the basement level.

Reginald Hall, mason-fixer, in the employment of Messrs. Newman & Mann, said he was engaged at the building on the day of the accident. He should think that from 7 ft. to 8 ft. in length of the wall had been cut out, and started at the top at from 2 in. to 2½ in. deep, so that it should increase to 4½ in. at the bottom. In cutting it out he did not cut under any of the beams coming through from Mr. Baron's house. The wall was tolerably good, and the bricks pretty sound. Plumbed the wall and found it 5 in. hollow. Plumbed it from floor to floor. The portion of the wall between ground floor and first floor hung over towards the new building, and the part below battered back towards Mr. Baron's house.

William Russell, bricklayer, in the employment of Messrs. Newman & Mann, deposed that the space cut away was 7 ft. long by 6 ft. 9 in. in height. Did not cut under any beam that came through from Mr. Baron's house.

Mr. John Kellow said he was clerk of works, employed by Messrs. J. & W. Wimble on the building from the commencement, but was not on the works the whole of the time. The original plan showed the whole of a new party-wall. Examined the old party-wall with Mr. Wimble and Mr. Wimperis. The upper portion, which was taken down, was rather defective, the brickwork being cracked in one or two places. The wall from these cracks downwards was tolerably good, but was taken down to the level of the first-floor joists. The wall was then underpinned before the new work commenced to be raised. The wall was underpinned because the basement required in the new building was deeper than the one in the old building, and the wall did not go down deep enough. It was part of his duty to see the ironwork fixed, which was done in accordance with the plans and detail drawings supplied by the architect. Had no means of testing the quality of the iron. Saw that the iron stanchion was properly fixed. The wall was cut away to receive the stanchion about 4½ in. in depth and 11 in. in width, and for the height of one floor. From the *débris* he could form no opinion as to the cause of the accident, nor could he make any suggestion as to the cause. The circular girder was fixed, as far as he could see, properly and in accordance with the plans. Had not calculated the weight on the stancheon; nor that upon the old wall. The new wall oversailed the old one about 1 in. or 1¼ in., and in some places less, but nowhere more. Saw the wall being plumbed, but did not notice how much it was out of the perpendicular. Did not become aware that it was 5 in. out of perpendicular. Knew it was not. It was about 1¼ in. out of the horizontal line, and hence the new work, being straight, oversailed the old wall in parts. The stone beneath the iron stancheon referred to was not broken. Could not say how the brickwork was: whether crushed or not. The wall was 1¼ in. out of the horizontal in the greatest deflection. There was nothing in the wall which gave it the appearance of being unsafe or he should have called the architect's attention to it. During the progress of the work he saw nothing in the mode of construction which would endanger the structure. If the old wall had been spongy it would have been found out when the underpinning was done. Was away owing to ill-health at the time the accident took place. It would have been advisable to have a detail drawing when the stairs came to be put in. Had no idea that the builders were going to cut away the wall in the basement. Should not have sanctioned it had he known it. Did not know what it could have been done for. He would not sanction cutting away a large piece like that because it was not a workmanlike way; it ought to be done in short lengths. As it was cut it would certainly tend to weaken the wall. Apart from that cutting away he thought the wall was sufficient to carry the weight on it. In his experience he had never seen worse ironwork, and had never seen as bad.

A Juryman.—Why did you allow it to be put up then?

Witness.—Its badness could not be seen until it was broken.

By the Coroner.—Remembered Sweetland saying on one occasion that it would have been better to have a new wall. He did not say anything about the wall being "funny," or "spongy." By Mr. Poland.—Sweetland said, "It looks curious to keep this old wall standing, and to build on top of it." Very probably he (witness) replied that he (Sweetland) must allow some one else to know. Had no plans pointing out the mode in which the stone staircase was to be fixed. By Mr. Reid.—Could not see defects in columns from external observation. Saw the circular girder fixed, and that it had a sufficient number of bolts. By Mr. Clarke.—The steps could have been fixed one at a time by cutting small holes about 12 in. by 6 in., one at a time.

Mr. Reid, on behalf of Messrs. Shaw, said that firm contracted for the whole of the ironwork; but the cast-iron columns were supplied to them by a sub-contractor, who had committed an egregious breach of contract. He was not prepared to controvert the evidence as to the bad quality of the columns.

Mr. John Johnson said he was an architect in practice on his own account, and occasionally rendered assistance to Mr. Wimble in preparing plans, &c. He deposed that he saw the old party-wall in question, and came to the conclusion that it was sound, except the upper portion. On the 17th of January he, in company with Mr. Wimble, visited the building, and saw where the old work had been cut away. The opening extended from below the trimmer to 18 in. beyond the beam furthest from the Haymarket, which carried Mr. Baron's house. He should say that the opening was about 12 ft. 6 in. wide by 8 ft. 3 in. high, or about that. One of the ends of the beams from Mr. Baron's house was visible. Gooch, the foreman, was present, and when Mr.

Wimble saw that the wall had been cut away he asked by whose orders it had been done? Gooch said he got orders from the builder's yard. Mr. Wimble replied that he (Gooch) had no business to cut the wall away without express orders from the architect. In his (witness's) opinion, the cutting away of the wall would seriously weaken it. Although this was his opinion, however, he saw no immediate danger. The bricks were good, hard purple bricks, not place bricks by any means. By Mr. Poland.—Thought that the wall was safe, but he would not say *perfectly* safe. Thought the old wall was sufficient to bear the weight of the new superstructure, but could not say exactly what that weight would be. Speaking generally, he thought the old wall would have to bear from 4 tons to 4½ tons per square foot. The portion of the old wall upon which the stanchion referred to rested would have to bear a weight of from 13 tons to 14 tons per square foot. The safe weight per square foot to put upon an old wall was matter of opinion. You might put as much as 25 tons per square foot on some old walls. Having given those weights, he still considered the cutting away of the wall to be unsafe, because shaking and disintegration must be allowed for. Would swear that the opening cut away was more than 8 ft. wide. He told the bricklayers to pin in the work with headers. He attributed the accident mainly to the cutting away of the wall, perhaps assisted by the badness of the ironwork. By Mr. Bazalgette.—Although he thought the cutting away of the wall rendered it not immediately dangerous, yet the building could not have been left in that state long. The wall was not spongy. The bricks were good. Some of the iron columns were very bad, and not sufficient to carry the superstructure permanently. He believed some would and some would not. One column would have to take (according to his calculations) 51 tons 19 cwt. if the floors were loaded. This was supposing them to be perfect cylinders. By Mr. Poland.—He concurred in the opinion that it was a safe thing to allow the portion of the old party-wall to stand instead of building a new party-wall throughout. He could not see why the wall should have been cut away where it was [in the basement], because the stone steps were not intended to be fixed into that part of the wall, but into the portion between the ground and first floors. By Mr. Bazalgette.—Was not aware of any formula for testing the strength of a fractured iron column.

The inquest was then adjourned until Friday (yesterday). Our report of the case will be continued next week.

THE SOANE MUSEUM.

THE lamented death of Mr. Bonomi, elsewhere mentioned, leaves vacant the office of curator of Sir John Soane's Museum. We understand that Mr. Wyatt Papworth is a candidate for the appointment, and in the interest of the public, as well as from good-will towards Mr. Papworth, of whom our memory is long, we sincerely hope that he will obtain it. We can remember Mr. Papworth at work in the Museum for the Institute of Architects years ago, in connexion with his old friend, Mr. Bailey, Soane's pupil, and then the Curator, so that Mr. Papworth's knowledge of the collection is of long standing. His acquaintance with architectural and other art books is, moreover, quite exceptional. The office is in the gift of the President and Council of the Royal Academy, and we are glad to find they have so eligible a candidate.

THE LEATHERSELLERS' NEW LIVERY HALL.

SIR,—In correction of the account given in your pages, allow me to say:—

The new buildings will comprise a Livery Hall, 72 ft. by 36 ft., a reception-room, cloak-room, lavatories, and, in addition, kitchen offices above the hall. The style of architecture adopted is Elizabethan, but the present contract embraces simply the structural portion of the building, the whole of the internal finishings and decorations being as yet undecided upon.

The several apartments and corridors will be warmed and ventilated by Mr. Wilson W. Phipson. The amount of the present contract is 16,900*l*.

G. A. WILSON,
Surveyor of the Company.

ROYAL ALBERT HALL.

A MOST homely and delightful concert of Welsh, English, Irish, and Scotch music took place at the Royal Albert Hall, on the evening of St. David's Day,—homely, because the greater part of the music was such as had pleased the domestic circles of previous generations, while it pleases the present; delightful, because the executants were those who always give pleasure to their hearers. We cannot resist mentioning the name of Madame Patey, whose reception must have been highly gratifying and was deserved; Madame Edith Wynne, always welcome; and Miss Mary Cummings, whose rich voice was most charming to listen to. The other sex were represented by Eos Morlais and Mr. Ap Herbert. The duet, "Flow, gentle Deva," of these gentlemen, produced a battle for an encore. Mr. Hollins and Mr. Shakspeare also gave aid. Among the many part-songs by Mr. W. Carter's choir, were the stirring "Men of Harlech," and "The Campbells are coming," which few among the audience could have heard before given with such precision. Mr. John Thomas, appropriate to the day, executed various harp solos, and the band of the Grenadier Guards materially assisted.

It may be well to say that the public arriving by railway can save themselves from exposure, should the evening be wet, for more than half the distance from the station to the hall, there being an entrance (just past the post-office) leading through the corridors and conservatory of the Royal Horticultural Society adjoining the hall. Were this generally known, perhaps, many more lovers of music would have set the wet night of St. David's Day at defiance. The managers of the concerts should give this information at the end of all their advertisements.

At the last general meeting of the seatholders, the other day, instructions were given to the council by the meeting to consider the desirability of obtaining a supplementary charter to admit of a wider use of the hall than is practicable under the strict lines of the original charter. The question seems well worth consideration. The hall, however, might be much more largely and diversely used than it is without any increased powers. Why do not some of our men of science test its value as a lecture-room, where they might gather round them such an audience as they could not seat elsewhere?

DR. MOHR ON "THE ATMOSPHERE AND OUR OBELISK."

SIR,—The fears expressed by Dr. Mohr that the granite obelisk will suffer severely from the gases of our atmosphere appear to be contradicted by the excellent state of preservation of the granite monuments in London.

London Bridge is 100 years old; the Duke of York's Column, 50; the Nelson Column, 30; the Crimean Monument, Westminster, 20; the Thames Embankment, 15.

These are all in a perfect state of preservation. During the last thirty years granite has been very generally used for the decorative parts of London buildings, which would scarcely have been done if the material had been liable to decay. I think, therefore, that it is scarcely necessary to coat the obelisk with alumina soap; not, at least, until the above monuments are seen to show decay.

Truly enough the gases of our atmosphere are very destructive to most materials, especially to the stone used for our public buildings.

Not an external stone exists of Henry VII.'s Chapel, or of the Temple Church, and scarcely of the Abbey, or Lambeth Palace. The magnificent Houses of Parliament have already been partly restored.

H. T.

BUILDING ON REFUSE.

SIR,—Is there any Act of Parliament that can be put in force to prevent the building of houses on refuse-heaps?

At the present time, near Lavender-hill, S.W., a builder has commenced the erection of a row of houses, two stories high, several of which are up and covered in. The next set to be run up will be on ground that is being made up with the emptyings of dust-bins, and the liquid sweepings of streets—to the depth of several feet—the whole resting on a natural bed of clay. If not prevented, the buildings will soon be covered in, and I would ask you if it is not reasonable to suppose that for years to come such houses will be nothing more nor less than fever dens? I cannot think the district surveyor has any power, because he lives close by, and does not seem to interfere.

A RESIDENT IN THE NEIGHBOURHOOD.

WASTE CONDITION OF KENSINGTON GARDENS.

THE state of the timber-trees in this beautiful inter-urban park might induce the belief that it had no belongings, and that there was neither ranger nor supervisor, as said before in the *Builder*. The trees are too close (in some places but 3 ft. or 4 ft. apart), and for the most part broken, rampiked, and conflicting; thus impeding the free and natural growth of glades, which, at the age of over 100 years, ought to be noble foresters. Her Majesty has long discontinued the use of the palace; but the public (and they have some rights of free park) throng the grounds in increasing numbers yearly. There is, however, only a portion of the expanse open to the wanderer, and chiefly the glades as first set out by Repton; these are four in number, and they show the beautiful contrast (still accordant) of verdant pastoral turf and freely branching forest trees. Although cut in straight lines, and of the uniform width of about 100 yards, these openings afford a vast relief to the wearied citizen, who seeks refreshment from rural scenery, even encircled by oppidan precincts; as to the rest, excepting only the traverse-route from the Albert Memorial to Bayswater, and the outlying shrubbed and flower-walk boundaries, there is no practicable footway except the path-route opened out diagonally from the Serpentine Bridge to Nottinghill. As for the four large areas of woodland lying between the glades, they are impassable in wet weather, and, from the too close proximity and deformity of the trees, are rather repulsive than inviting to the wanderer.

Now there is a way to remedy all this, and at the same time to assure vast improvement in the now *waste Gardens*, which ought to be an ornament instead of a disgrace to the greatest of cities. One half of the trees, at least, ought to be cut away, in order to make room for the free growth and "bran'cage" of the remainder, and to give an open for the still more decorative effect of greensward, which would afford free and healthy intercourse for promenading visitors.

At least 1,000 trees, mostly lopped, broken, or bare poles, might be cut away and sold; and this would yield at least 1,000*l*. or 2,000*l*. If Messrs. Ransome's steam-sawing machinery for cutting down trees were used, the whole might be effectuated in one week,—the timber to be sold and carted away *à loisir*. Thus there is yet sufficient time to open the way for free growth of the trees before spring, and to give free space for the spreading branchy tendencies of the old foresters.

QUONDAM.

BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

THE eleventh annual general meeting was held on Tuesday evening, February 26th, at the offices, 27, Farringdon-street, Mr. Thomas F. Rider (president elect) in the chair. There were present Mr. Thos. Stirling, Mr. H. T. Bayes (treasurer), Mr. E. Graystone, Mr. T. H. Winney, Mr. E. Brooks, Mr. J. Robson, and other friends of the Institution.

After the Secretary had read the report and balance-sheet for the past year, the Chairman, in moving their adoption, said, in the course of his address:—Abstracts are a very common part of our business, as you all know, and I have made an abstract of your balance-sheets for the eleven years the Institution has been in existence, and the result is that I find you have received in subscriptions 2,242*l*. 14s. 6d.; in donations, 927*l*. 16s. 6d.; and interest on invested funds, 279*l*. 6s. 9d.,—making 3,451*l*. 17s. 9d., out of which, after meeting all claims, and effecting the purchase of a presentation to the Orphans' working school at a cost of 262*l*. 10s., you have saved enough to invest the sum of 1,100*l*. in New Three per Cents. These results are, I think, most gratifying; but still I have been looking to see what I could recommend as an improvement on the working, and first I analysed your list of subscribers, and was struck with the fact that though there appears to be in the London district upwards of 1,600 builders and contractors, most of whom keep one clerk, and some a good many, only 45 building firms and 53 clerks appear in your list out of a total number of 254 subscribers, the remainder being merchants and others connected with the various branches of the trade. This is not as it should be, and I trust we shall consider, during the coming year, if this Institution cannot be brought more fully to the notice of builders' clerks, and more of them induced to join in rendering it self-supporting.

Mr. Thos. Stirling, in seconding the adoption of the report, urged the builders' clerks generally that they must exert themselves to make their Institution thoroughly self-supporting, which he thought they might easily do.

A vote of thanks was then passed to the president and other retiring officers, which Mr. E. Graystone acknowledged, on behalf of Mr. Edwin Lawrence, who was unable to be present. The officers for the ensuing year were then elected, and a hearty vote of thanks to the chairman brought the meeting to a close.

MYCENÆ.

SIR,—When I read Dr. Lindenschmidt's article in the *Allgemeine Zeitung* some weeks ago, I forgave him, assuming that he might not know English well, or could not see a joke. For, in truth, what I had said about a tribe of Germans having strayed to Mycenæ was surely very obvious chaff. And, remember, he makes this his strong point. To me it is not a little singular that when his own countrymen are regretting his performance, you should republish it here without apparently referring to the original sentence in the *Academy*, which he managed to misunderstand. As for the rest of his criticism, I should have been pleased to answer it if it had been intelligible. The German is bad enough, but the English is worse. It seems to be the production of a German who also may have an imaginary offence to resent.

A. S. MURRAY.

ARTESIAN WELLS.

SIR,—Knowing the interest your valuable paper takes in the question of water supplies for towns, large works, breweries, &c., and the source from whence obtained, and how obtainable, I beg to give particulars of the following satisfactory results that I have just arrived at from a boring in the Isle of Wight for Messrs. W. B. Mew, Langton, & Co., brewers to her Majesty the Queen (Newport), the increasing business of these gentlemen making it necessary for them to obtain an unlimited supply of pure water. Having been called in by Mr. Arthur Kinder, of Mansion House Chambers, Queen Victoria-street, consulting engineer to the firm, I commenced a boring some eighteen months ago, and after very great trouble and many difficulties, from the fact that the strata in the island are so peculiar and irregular,—in fact, to use a well-known phrase, "entirely upside down,"—I have, at the depth of 436 ft., achieved the results we desired. During the progress of this work, the opinions of eminent geologists and gentlemen acquainted with the water-bearing strata have been called in, and the results now arrived at put aside most of their calculations in consequence of the convulsed state of nature in that locality. Mr. Kinder and myself, with the gentlemen of the firm (the latter undaunted by adverse opinion), however, confidently believed that an unlimited supply would be obtained at about a depth of 450 ft. to 500 ft. below the surface. At 400 ft. we came upon a very thick bed of white marl and shells, with no trace of a spring, but at 436 ft. a water-bearing stratum was reached, and the water flows through the boring-tubes 9 ft. above the surface of the ground-line at the rate of 200 gallons an hour; and at 6 ft. below the surface, on testing the same, I found the supply to give 1,450 barrels in the twenty-four hours. The well, itself, I might observe, is sunk to the depth of 138 ft., with 5 ft. diameter, the boring being continued from that point to a depth of 461 ft. This is an eminently satisfactory result, considering it is a real artesian supply, and the water, from analysis, is found to be perfectly pure.

This affords a great contrast to the well that I bored at the New Post-office in St. Martin's-le-Grand to the depth of 636 ft., the water rising to 139 ft. from the level of Newgate-street, a sufficient success to make me believe a metropolitan supply of pure water may be obtained from other sources than the water companies. This latter well will yield something under 200,000 gallons per day from the chalk, but the supply could be increased by taking in the water from the sand springs that is now shut out by cast-iron cylinders to about 275,000 gallons a day. Again, at Victoria Park the one boring I there carried out to the depth of 514 ft. 6 in. in diameter, gives a large supply of fine water. At Tottenham, as you will know, the water supplied always stands first in Dr. Frankland's report, and this is obtained at a depth of 325 ft. from a boring I advised and carried out, taking the water thus obtained through a tunnel 55 ft. below the surface to an old well, and this supply is now giving water to about 30,000 inhabitants. As the question of bringing a water supply to London from different parts of the country, even from Scotland, has been discussed, it is my opinion it can be obtained from a much nearer source. Trial borings which I made at Braceborough Spar, near Errandine, Lincolnshire, prove that district to be charged with a water supply almost unlimited, as it flowed 14 ft. above the surface at the rate of 260,000 gallons a day, and this supply I believe is being made available for several large towns. Knowing the vast importance of our water question, I have ventured to trouble you with these remarks. My firm belief is that pure water is to be obtained in much larger quantities than at present supposed from artesian sources, and in my fifteen years' experience I have never had a failure, always successfully carrying out what has been desired.

W. BROWN, Engineer.

THE TEMPLE BUILDING.

SIR,—I have just noticed in the *Builder* of the 23rd ult. the following words:—"All the masons required have long since been obtained, and eight or ten applications per day are being made for work."

This incorrect statement is likely to do me harm in more ways than one; and I beg that you will allow me space to state that I am still in want of *superior* masons at these works.

It is quite true that many applications are made for work, but most of these are by masons who are quite unable to execute such elaborate workmanship as is required for these buildings.

G. W. BOOTH.

*** The statement in question was made to our reporter by Mr. Booth's manager on the works.

TRADE MATTERS.

SIR,—In your issue of February 16th, and under the heading of "Trade Matters," your correspondent, "Clerk of Works," has presumed to enlighten your numerous readers on a question of which he is evidently ignorant, inasmuch as it applies to my connexion in the matter, and, doubtless, equally so as respects Messrs. Taylor and Neal, and the "scores of others." If I had waited for the union to raise my position, I should have been sadly disappointed; it was only by striking out from that union, and taking independent action entirely in opposition to the interference with individuals (which is the plan of the union) that the foundation of my success was laid. And I say, that had I not taken this course, I should have been, as many of my then compeers are now, the submissive agent of a great and depressing system.

"Clerk of Works" would have been able to have obtained the true state of the case if he had taken the trouble to make inquiries of the parties he mentions, and I am sure there would be no difficulty in proving to him that it is not through the unions that any man has obtained a position, but, on the contrary, a union man can never rise, as it is quite incompatible with the rules of the association.

J. BASTOW.

WORK AND WAGES IN THE BUILDING TRADE.

SIR,—In my opinion, your columns were never put to a more important use than in the discussion of the above subject. Would that all members of trade unions carefully considered the question as presented in the *Builder*. I have had more than thirty years' experience in quarrying stone, and I can most confidently assert that quarrymen do not do so much work now at 5s. per day as was done when the wages were 3s. 6d. per day. I do not object to the advance of wages. A good quarryman ought to have 5s. per day; but the most vexatious thing to me, during the past few years, has been that the men should insist upon a uniform rate of wages to all men who appeared in the garb of stone-getters, though they knew well (and in some cases admitted the fact) that many of the men were not worth 3s. 6d. per day, but, forsooth, they must have 5s. per day, the same as the rest: hence it is the decadence in the work that has been the greatest hardship the masters have had to endure. The facts so clearly given by Mr. Lucas ought to make men connected with the stone trade open their eyes. The advance in stone, but more particularly the unreasonable demands of the masons, have been fraught with great evils to the men themselves; by their action they have done all they could to drive the stone trade away. In a correspondence I had some months ago with an architect, whose name frequently appears in the *Builder*, he says,—"I am sorry to have to also say that, as a rule, now I put the least possible stone in buildings, for the reason that the last two or three years such annoyance and inconvenience have been caused by the working masons as almost to compel architects to adopt this course. As soon as they are satisfied to work a fair day's work for a fair day's pay, that part of the building trade will be more encouraged."

STEPHEN SEAL.

The Earl of Rosebery is to be the next president of the Sunday Society, which seeks to obtain the opening of museums on Sundays. His lordship will deliver his address as president at the public annual meeting, on Saturday, May 8th.

ACTION BY A LOCAL BOARD SURVEYOR FOR SLANDER.

KELLY *v.* FITZPATRICK.

THIS case was heard before Baron Pollock at Liverpool the other day. The plaintiff was Mr. Wm. Kelly, surveyor to the West Derby Local Board, and the defendant was Dr. Fitzpatrick, a member of the Board in question. The action was brought to recover damages for slander. The allegation of the plaintiff was, that the defendant had used language respecting him at a meeting of the Board which implied that he was incompetent.

It appeared that the plaintiff had been directed by the Board to prepare a scheme for the drainage of the Derwent estate, which belonged to the district of West Derby, and that the scheme received violent opposition from the defendant and others, while Colonel Cox, one of the Government inspectors, reported in favour of the scheme. At a meeting of the Board, held on the 7th of August last, the defendant made a speech, and in the course of his observations he said Mr. Kelly was incompetent to give an estimate; that he did not know the value of a cube foot of stone, and that he did not even know the value of a brick. Other offensive personal remarks, not, however, reflecting on the professional ability of plaintiff, had been made by the defendant. The plaintiff did not sue for damages, but simply desired to vindicate his professional character.

It was pleaded on behalf of the defendant that the remark about the plaintiff not knowing the value of a brick was "a metaphor."

An apology having been tendered and accepted, the case was withdrawn from the jury.

We understand that Mr. Kelly sent in his resignation the day after the apology was made. His resignation was accepted.

CASE UNDER METROPOLITAN BUILDING ACT.

FIREPROOF SEPARATIONS.

AT the Hammersmith Police Court, on the 22nd ult., a summons was heard before Mr. Bridge, which had been taken out by Mr. Thos. E. Knightley, district surveyor, against Mr. Thos. Ayres, a pawnbroker, carrying on business in Hammersmith, for having let a portion of his premises without providing a proper fireproof floor, as required by Section 27, rules 2 and 3, of the Building Act.

The district surveyor stated that defendant was the owner of large premises in which he carried on business; he formerly occupied the whole of the premises, but recently had let a portion of the ground-floor to a person who carried on a separate business, he (the defendant) retaining the first floor and upper parts running over it. Two distinct premises thus existed in one building, each tenanted by different persons, no regard being paid to the means for checking the spread of fire (should such occur) from one to the other. In such cases the Act provided that the premises should be divided so far as they adjoin horizontally by party-arches or fireproof floors. He had met defendant on the spot, and suggested the best mode of constructing a floor such as he could pass. Had adjourned the present summons from time to time to afford fair and reasonable opportunity for carrying out the work; yet nothing had been done, and he now asked for an order to be made in the terms of the summons.

The defendant did not appear, and the magistrate requested the district surveyor to prove his case; whereupon he called his assistant, who spoke to the existence of the aforesaid defects, and produced copy of notice served upon defendant in respect of same; and after hearing this additional evidence, Mr. Bridge made the necessary order for the work to be executed forthwith.

Good News,—if True.—The *Birmingham Daily Gazette* declares "the Ventilation Problem solved," and says:—

"Hitherto thorough ventilation has usually been attended by a thorough draught. A new principle, however, has been devised, and there is now no occasion for any one who is prepared to make an extremely moderate outlay to suffer, either in private residences or public assemblies, from the inhalation of vitiated air. The principle has been introduced with complete success, and at comparatively small cost, by Mr. T. Kenington, into the Birmingham and Midland Eye Hospital, the various departments of the *Daily Gazette* Offices, and into several institutions, manufactories, and other buildings, in which the test has proved absolutely satisfactory. The pure external air is admitted by a simple shaft, and ascends in a straight column to the ceiling, when it disperses itself, and, after gradually but certainly excluding the impure air, finds its exit, without having occasioned any draught whatever."

Is this, after all, only the system for which Mr. Tobin has sought, without success, to claim the exclusive merit?

LINCOLN MASTER BUILDERS' ASSOCIATION.

THE annual dinner of the above Association was held a few days ago at the Monson Arms Inn. Mr. W. Kirk, chairman of the Association, presided; Mr. Sims, secretary, filled the vice-chair, and over thirty of the principal local builders and others connected with the building trade also attended.

Mr. H. S. Close proposed the health of "The Chairman of the Association," to whom, he said, the members were much indebted. From the time the Association was formed, their worthy chairman had spared neither time, trouble, nor, in many cases, money, to further the objects for which it was established. It was no small matter to conduct the business of an association such as theirs, and though their secretary, Mr. Sims, had the bulk of the work to do, yet many duties devolved upon the chairman, and these Mr. Kirk was ever found willing to undertake. In proposing the toast, he (Mr. Close) was only preparing the way for a little surprise the committee had in view, and which Mr. Sims would no doubt make known to them; but he felt sure all would agree with what he had felt bound to say respecting their chairman.

Mr. Sims said it was about twelve years since the first meeting of the local master-builders was held, to consider some application from the operatives, and shortly after, on their casting about for some one to fill the post of chairman of the newly-formed Association, Mr. Kirk promptly undertook the office, and from that time to the present he had ably and willingly undertaken all the duties which fell to his lot. So impressed were the committee with the value of their chairman's services to the Association, that at one of their meetings it was suggested they should, as a kind of acknowledgment, present him with his portrait. It was ascertained that Mr. Slingsby had some time previously taken a photograph of Mr. Kirk, and as it was considered by them to be an admirable likeness, Mr. Slingsby was instructed to enlarge it to life-size, and paint it in oil.

Mr. Henry Barnes, on behalf of the committee, then handed the portrait to Mr. Kirk, who acknowledged it with much emotion. It is enclosed in a massive gilt frame, bearing the following inscription:—"Presented by the Lincoln Master Builders' Association, February 9, 1878, to W. Kirk, esq., chairman, in recognition of his valuable services."

Miscellanea.

A Group of Cases.—More than a hundred English intending exhibitors at the forthcoming Paris Exhibition have placed in the hands of Mr. Frederick Sage, of Gray's-inn-road, the manufacture of their various show-cases, and, with one exception, the design has been left to him also. Being principally of ebonised mahogany, with ornamental gilding, too great a similarity strikes the mind of the viewer as they are seen together. Whether there were any instructions from the Managers of the Great Show to this effect, we know not. But if so, a great mistake was made in not permitting a larger scope for colour, and the combination of various woods. One case for Messrs. Nettlefold, designed, we understand, by Mr. Chatfeild Clarke, although not in a sufficiently forward state to give any idea of the effects, is mainly of walnut and satin woods, and will, no doubt, attract the eye when placed among those described above. The manufacture of the whole does great credit to Mr. Sage, who has long made such work a specialty, and for the purpose has employed 300 men, spread over his workshops of many acres in extent, which are fitted up with all the latest and best machinery.

Mr. Lascelles and the Paris Exhibition. The intended exhibit by Mr. Lascelles in the Champ de Mars, as announced in our advertising columns, is so considerable and remarkable that we think it right to draw attention to it. It includes whole houses, works in concrete, decorations, furniture, and conservatories. When we add that the services of Mr. Norman Shaw, Mr. Alfred Waterhouse, Mr. Redgrave, Mr. George Devey, and Mr. Phené Spiers have been called in for designs, it will be seen that the term "remarkable" is not misapplied. It appears from the morning papers that H.R.H. the Prince of Wales, when in Paris the other day, was much interested in Mr. Lascelles's concrete building slabs.

The National Gallery Improvement Scheme.—At a meeting of the Vestry of St. Martin's-in-the-Fields on the 21st ult., the clerk (Mr. Dangerfield) reported that as the result of the deputation which recently waited upon the Hon. Gerard Noel, First Commissioner of Works, to urge upon him the necessity of pulling down the old workhouse in Hemming's-row, and widening that thoroughfare, which it was agreed eleven years ago that the Government should carry out as a part of the National Gallery improvement scheme, he had been in communication with the officials at the Office of Works, and was informed that a portion of the building was still necessary for Government purposes, and that it was an inopportune time to call upon the Government to do anything in the matter; but at the same time it was the feeling of the First Commissioner that the old building should be removed whenever there was a convenient opportunity. In reference to the widening of Hemming's-row, the First Commissioner did not think that would be of any service until Castle-street was widened. There was a good feeling at the Office of Works to assist the Vestry, although they could not hope for immediate action. He mentioned that the late fire in Castle-street had placed the Metropolitan Board of Works in a position to purchase the site towards the improvement.

The Late Mr. S. Smirke.—The will (dated January 12th, 1872) of Mr. Sydney Smirke, R.A., formerly of Regent-street and Grosvenor-street, Grosvenor-square, and late of the Hollies, Tunbridge Wells, who died on December 8th last, was proved on the 30th ult. by Thomas Lambert, Miss Margaret Jane Dobson, and Simon Adams Beck, the executors, the personal estate being sworn under 80,000*l.* The testator bequeaths all the honorary medals presented to him or any of his family in his possession, to his daughter for life, and then to the president and council of the Royal Academy, to be by them preserved for ever; his furniture and household effects to his daughters; to Mr. Beck, 200*l.* per annum, for managing his property; upon trust, for each of his daughters, Isabella Lange, Mary Octavia, and Margaret Jane, such a sum as will produce 650*l.* per annum; and upon trust for his son, Albert John, for life, 5,000*l.* in Consols; and the rest of his property he gives to his three sons, Sidney, Edward, and Alfred.

Cleopatra's Needle.—With reference to the action for salvage in the Admiralty Court, in accordance with the ordinary rule of the Court, affidavits of value were filed by the owners. The Needle was valued, at the weight of the stone, at 250*l.*, and the ship at the same amount, its breaking-up value. The salvors being dissatisfied, filed a motion praying the Marshal of the Admiralty, Mr. R. G. Browne, to appraise and sell the Needle and case by public auction. The suit came before Sir Robert Phillimore in the Admiralty Division on Tuesday, an action having been brought by Mr. John Dixon, the owner of the vessel and its cargo, against Messrs. Burrell & Sons, the owners of the steamship *Fitzmaurice*, the salvors, for the purpose of obtaining a salvage award from the Court. The joint value of the ship and cargo was now fixed at 25,000*l.*

Cromwell House.—A distinguished party, including the Duke and Duchess of Teck and their children, were present on Tuesday afternoon last, to witness the representation of a new version of Mrs. C. J. Freake's charming "Allegory." With a beautiful scene, some very agreeable music, specially composed by one of Mrs. Freake's friends, and some appropriate dancing, the success was complete, and the hostess's guests were delighted. Special praise must be given to Mr. Brandram (*Christmas*), Mrs. F. Copleston (*Old Year*), Mrs. Brandram (*Old Time*), and Mr. Charles Colnaghi (*Will o' the Wisp*).

Architecture: Paris Exhibition.—The Committee of the Royal Institute of British Architects have carefully examined the architectural drawings and photographs, received at South Kensington by the Secretary to the British Commission. The entire number of drawings would have occupied 2,086 ft., while the committee had only 1,150 ft. of wall space, and a small screen to allot. It was obviously impossible to select for transmission to Paris more than about two-thirds of what have been offered, and the committee have been obliged to decline many excellent drawings, simply for want of room.

Birmingham Builders' Association.—Mr. Walter Clulee, of the firm of Bunkle & Clulee, public accountants, of Waterloo-street, Birmingham, has been appointed secretary to this Association, in the place of the late Mr. G. E. Jeffery.

Whitechapel Haymarket.—A correspondent, "H. W.," denies that the Vestrymen of Limehouse supported the proposed removal of the Whitechapel Haymarket. They divided on it, he says, as eight for and ten against.

St. Paul's, Covent Garden.—A correspondent, "R. P.," calls attention to what he terms the disgraceful condition of the exterior of this historical structure.

TENDERS

For Bengeo Water-supply Scheme, Hertford Union:—

Laidlaw & Son	£2,717 0 0
Fisher	2,190 0 0
Potter	2,280 0 0
Hunt	2,247 12 6
Bugbird	2,077 0 0
Painter	2,068 0 0
Pryke	1,999 0 0
Gray	1,990 0 0
R. Doowra	1,985 0 0
Rayment & Son (accepted)	1,930 0 0

For the erection of a pair of semi-detached residences, Christchurch, Ipswich. Messrs. Wright & Wright, architects:—

Luff	£1,288 0 0
E. & E. C. Gibbons	1,250 0 0
Grayston	1,135 0 0
Thwaites (withdrawn)	948 0 0

For the erection of Mission-room, Hornsey-rise. Mr. Alfred W. N. Burder, architect. Quantities supplied by Mr. George Sparrow Harrison:—

Staines	£1,866 0 0
Roberts	1,797 0 0
Hunt	1,795 0 0
Williams	1,735 0 0
Grover	1,653 0 0
Castle	1,595 0 0
Crocket	1,578 0 0
Nightingale	1,563 0 0

For house and studio, Finchley-road. Mr. Wm. Smit architect. Quantities supplied:—

Manley & Rogers	£4,298 0 0
Bayes & Allen	3,722 0 0
Dove, Brothers	3,459 0 0
Jarvis & Son	3,431 0 0
Stimpson & Co.	3,430 0 0
Patman & Fotheringham	3,375 0 0

For new pier, South Parade, Southsea. Mr. George Rake, engineer. Quantities supplied by Mr. H. P. Foster:—

Butterley Iron Company	£9,370 0 0
Dixon	8,000 0 0
Laidlow, Sons, & Caine	7,969 0 0
Young & Co.	7,916 4 6
Finch & Co.	7,770 0 0
Goddard & Massey	7,626 15 0
Shaw & Co.	7,480 0 0
Horsley Iron Company	7,480 0 0
Jukes, Coulson, & Co.	7,476 0 0
Goodenough	7,194 0 0
Head, Wrightson, & Co.	7,181 15 0

For house and stables for Mr. T. W. Finton, at Farnborough, Hants. Messrs. Graves & Hulbert, architects:—

Years & Co. (accepted)	£2,022 0 0

For alterations, &c., at St. Philip's Church, Arlington-square. Mr. Hugh R. Gough, architect:—

Grover	£1,360 0 0
Henry & Wallace	1,353 0 0
Dove, Brothers	1,295 0 0
Bayes, Brothers, & Allen	1,227 0 0
Hughes	1,147 0 0
Bishop	1, 80 0 0
Danson	1,049 0 0
Smith & Son	889 0 0

For the erection of two detached residences on the Gunnersbury Estate, Gunnersbury, Chiswick, for Mr. A. Bassano. Mr. Richard Tomlinson, architect. Quantities supplied:—

Wilson	£2,200 0 0
Brunsden	2,040 0 0
Bailey	1,900 0 0
Nye	1,836 0 0
Simms	1,680 0 0
Esden (accepted)	1,590 0 0

For the rebuilding and reinstating of the Blackfriars Flour Mills, Blackfriars-road, after fire, for Messrs. H. R. Perry & Co. Messrs. Taylor & Locke, architects. Quantities supplied:—

Morter	£1,293 0 0
Yardley	1,248 0 0
Deards	1,158 0 0
Conder	1,093 0 0
High	1,090 0 0
Hoare & Son (acceptad)	1,083 0 0

For additions to Caldecote House, Bushey Heath, Herts, for Mr. C. E. Jones. Messrs. Batterbury & Huxley, architects:—

Chadwick, accepted.

For extensions to Messrs. Cleaver's Bleaching Works, Nottingham. Mr. S. Dutton Walker, architect:—

Harris	£261 0 0
Tynam	237 15 0
Stevenson	236 0 0
Bailey	235 0 0
Whitworth	226 0 0
Vickers	223 0 0
Bell & Son (accepted)	215 13 0

For alterations at the Duke of Cornwall Tavern, Lismore-circus, Haverstock-hill. Mr. J. R. Furniss, architect. Quantities supplied :—

Toms	£1,289	0	0
Williams & Sons	1,261	0	0
M'Lachlan & Sons	1,145	0	0
Schlater	1,139	0	0
Drew	1,113	0	0
Anley	1,097	0	0
Parker	945	0	0
Gas-fitting.			
Mescock	£50	0	0
Winn	42	0	0
Vaughan	41	10	0
Goldsworthy	35	10	0
Pewtering.			
Watts	£50	0	0
Grimes	34	0	0

For the erection of a new chimney-shaft and boiler-house at the Brewery, Caledonian-road, for Messrs. Alex. Gordon & Co. Mr. George Scamell, architect. Quantities supplied by Messrs. R. L. Curtis & Sons :—

Holland & Hannen	£1,190	0	0
Lawrence & Sons	1,182	0	0
Laurence	1,147	0	0
Mowlem & Co.	998	0	0
Kirk & Randall (accepted)	976	0	0
Scrivener & White	965	0	0

For the erection of cemetery chapels, lodge, fence-walls, &c., at Brimington, Derbyshire, for the Brimington Burial Board. Messrs. Rollinson & Son, architects :—

Wright & Boler	£2,898	0	0
Barber	2,854	0	0
Askew	2,837	0	0
Wright	2,820	0	0
Cropper	2,610	14	0
G. Stevenson	2,610	0	0
R. Stevenson	2,600	0	0
Fidler, Brothers	2,593	0	0
J. Fidler	2,510	0	0
Tutin (accepted)	2,349	0	0
Brown & Bailsford	2,180	0	0

For alterations at the Phœnix public-house, Union-street, Lisson-grove. Mr. Millar, architect :—

Wilson, Brothers	£594	0	0
Cole	590	0	0
Beale	547	0	0
Conway, Brothers	450	0	0
Patterson	380	0	0

For the erection of stabling, &c., for the London General Omnibus Company (Limited), at Bow Common-lane, Burdett-road, Bow. Mr. Alfred Tosh, architect. Quantities by Mr. A. J. Bolton :—

Julian & Co.	£7,514	0	0
Salt	7,055	10	0
Sampson & Parish	6,900	0	0
Gould & Brand	6,693	0	0
Crabb	6,600	0	0
Mason & Bristy	6,460	0	0
Niblett	6,397	0	0
Perkins	6,373	0	0
Aitchison & Walker	6,273	0	0
Beale	6,195	0	0
Kellaway	6,000	0	0
Hunt	5,978	0	0

For laying pipe sewers in Burlington-gardens, Acton, for Mr. J. C. Taylor. Mr. Edward Monson, Jun., architect :—

Taylor	£551	9	6
Serff & Stodard	518	0	0
Willis	514	0	0
Thompson & Son	444	0	0
Jackson	435	0	0
Pizzey	425	0	0
Torkington	390	0	0
Colson, Brothers	373	0	0
Warne	365	0	0
Blight (accepted)	349	19	6

TO CORRESPONDENTS.

A. S. M.—J. P.—R. C. S.—H. S.—S. D. W.—T. E. K.—F. N. K.—G. T.—M. J. C.—Messrs. G.—H. S. N.—E. M. Jun.—H. S. S.—W. M. W.—A. J. B.—J. H. F.—W. C.—Rev. P. F. H.—H. P. F.—C.—Mr. S.—R. P.—H. W.—H. T.—A. & Co.—J. B.—S. & Co.—S. R. & Son.—F. P. (no information).—W. M. (already reported).

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

CHARGES FOR ADVERTISEMENTS.

SITUATIONS VACANT, PARTNERSHIPS, APPRENTICESHIPS, TRADE, AND GENERAL ADVERTISEMENTS.

Six lines (about fifty words) or under ..... 4s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

Terms for series of Trade Advertisements, also for Special Advertisements on front page, Competitions, Contracts, Sales by Auction, &c. may be obtained on application to the Publisher.

SITUATIONS WANTED.

FOUR Lines (about THIRTY words) or under ..... 2s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

REPLIES TO ADVERTISEMENTS,

Adressed Box ——, Office of "The Builder,"

Cannot be forwarded, but *must* in all cases be *called for*, and the Office Receipt produced.

THE CHARGE FOR A BOX IS AS UNDER :—

For "Situations Wanted" Advertisements ..... 3d. per Week.
For all other Advertisements ..... 6d. per Week.

PREPAYMENT IS ABSOLUTELY NECESSARY.

*** Stamps *must not* be sent, but all small sums should be remitted by Money Order, payable at the Post-office, King-street, Covent-garden, W.C. to DOUGLAS FOURDRINIER, Publisher, addressed to No. 46, Catherine-street, W.C.

Advertisements for the current week's issue must reach the office before THREE o'clock p.m. on THURSDAY.

The Publisher cannot be responsible for TESTIMONIALS left at the Office in reply to Advertisements, and strongly recommends that COPIES ONLY should be sent.

TERMS OF SUBSCRIPTION.

"THE BUILDER" is supplied *direct* from the Office to residents in any part of the United Kingdom at the rate of 19s. per annum. *prepaid.* Remittances payable as above.

NOTICE TO SUBSCRIBERS.

THE INDEX and TITLE-PAGE for the Volume of last year (1877) was given as a Supplement with the Number for January 19th last.

A COLOURED TITLE-PAGE may be had, gratis, on personal application at the Office.

CLOTH-CASES for binding the Numbers are now ready, price 2s. 6d. each; also

READING-CASES (Cloth), with Strings, to hold a Month's Numbers, price 2s. each.

THE THIRTY-FIFTH VOLUME of "The Builder" (bound) for the year 1877 is just published, price One Guinea.

SUBSCRIBERS' VOLUMES, on being sent to the Office, will be bound at a cost of 3s. 6d. each.

Asphalte.
Seyssel, Patent Metallic Lava, and White Asphaltes.
M. STODART & CO.
Office :
No. 90, Cannon-street, E.C. [ADVT.]

Bath Stone of Best Quality.
RANDELL, SAUNDERS, & CO. (Limited), Quarrymen and Stone Merchants.
List of Prices at the Quarries and Depôts; also cost of transit to any part of the Kingdom, on application to
Bath Stone Office, Corsham, Wilts. [Advt.]

Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 38, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. [ADVT.]

Whitland Abbey Green Slates.—These slates are of a grey green tint, are stout, and made in all sizes. A large stock available for immediate delivery.—For further particulars, apply to MANAGER, Clynderwen, R.S.O., Carmarthenshire.—[ADVT.]

J. Sessions & Sons, Docks, Gloucester, Manufacturers of ENAMELLED and PLAIN SLATE CHIMNEY-PIECES, URINALS, &c. WELSH ROOFING SLATES direct from Quarries, to any station in the Kingdom. Prices and terms on application. [ADVT.]

TEMPORARY ASSISTANCE (first-class) rendered to Architects, Engineers, and Contractors. Finished, working, and perspective drawings. Artistic colouring. Surveying and levelling. Architectural and engineering quantities rapidly and accurately taken out. Works measured up. Estimates prepared.—J. A. B. 6, Westminster-chambers, S.W.

MICHELMORE & REAP,
Manufacturers of
CHARLES COLLINGE'S PATENT
COLLINGE'S PATENT HINGES, LEVER, SCREW, & BARREL BOLTS,
and IMPROVED GATE FITTINGS of every Description.
36A, BOROUGH ROAD, LONDON, S.E.
Discount to Builders. Illustrated List, two stamps.

IMPERIAL FIRE INSURANCE COMPANY (Established 1803), 1, Old Broad-street, E.C. and 16 and 17, Pall-mall, S.W.
Capital, 1,600,000*l.* Paid up and invested, 700,000*l.*
E. COZENS SMITH, General Manager.

CLERICAL,
MEDICAL, and GENERAL,
LIFE ASSURANCE SOCIETY,
13, St. James's-square, London, S.W.
CITY BRANCH : MANSION HOUSE BUILDINGS, E.C.

FINANCIAL RESULTS.

The Annual Income exceeds	£270,000
The Assurance Fund is over	2,107,000
The New Policies in the last year were 544, assuring	302,115
The New Annual Premiums were	9,632
The Total Claims by Death paid amount to	3,736,794
The Subsisting Assurances and Bonuses amount to	6,356,382

DISTINCTIVE FEATURES.

Credit of half the first five Annual Premiums allowed on whole-term Policies on healthy Lives not over 60 years of age.
Endowment Assurances granted, without profits, payable at death or on attaining a specified age.
Invalid Lives assured at rates proportioned to the risk.
Claims paid thirty days after proof of death.

BONUS.

The Reversionary Bonus at the Quinquennial Division in January, 1877 (amounting to 357,014*l.*), averaged 50 per cent. and the Cash Bonus 30 per cent. on the Premiums paid in the 5 years.
THE NEXT DIVISION of PROFITS will take place in January, 1882, and Persons who Effect NEW POLICIES BEFORE THE END OF JUNE NEXT will be entitled at that Division to one year's additional share of Profits over later Entrants.

REPORT, 1877.

The 53rd Annual Report just issued, and the Balance Sheets for the year ending June 30, 1877, as rendered to the Board of Trade, can be obtained at either of the Society's Offices, or any of its Agents.

GEORGE CUTCLIFFE,
Actuary and Secretary.

THE MIDLAND LAND and INVESTMENT CORPORATION, LIMITED.
ESTABLISHED 1864.
CHIEF OFFICES—42, WATERLOO-STREET, BIRMINGHAM.
LONDON OFFICES—32, GREAT GEORGE-ST. WESTMINSTER, S.W.

Capital Authorised, 500,000*l.*; Capital Subscribed, 248,900*l.*; Capital Called up, 62,225*l.*; Capital Uncalled, 186,675*l.*
Reserve Fund, 100,000*l.*

DIRECTORS.
FRANCIS SEDDON BOLTON, Chairman.
HENRY ALLBUTT, SAMUEL BRIGGS, JAMES DEYKIN, JOHN HINKS, MAXIMILIAN LINDNER, HENRY ROLLASON.
JAMES H. IVORY, SECRETARY.

DEPOSITS received at Interest upon the following terms :—
At 23 days' notice, 4 per cent.
At 3 months' notice, 4½ per cent.
For Sums of not less than 100*l.* deposited for a fixed period of 12 months, 5 per cent.
Interest Warrants issued half-yearly—30th June and 31st December
Ample Security is afforded to Depositers by Assets and Investments in Freehold and Leasehold Estates, and by the large Uncalled Capital of the Corporation.
ESTATES and PROPERTIES Purchased.
FREEHOLD and LEASEHOLD GROUND-RENTS for SALE.
ADVANCES made upon APPROVED FREEHOLD or LEASEHOLD SECURITIES.
Full particulars may be received of, and deposits can be paid to, the London Agent of the Corporation, Mr. J. H. HILEY, 32, Great George-street, Westminster, S.W.

ILLUSTRATIVE MODELS, made from Drawings to reduced scale, for Architectural or Civil Engineering purposes, to show construction, or for artistic effect.—F. H. McLAUCHLAN, 19, Dalyell-road, Stockwell, S.W.

ADVANCES MADE to any amount on buildings in progress.—Apply to Messrs. HILL & WILCOCKS, 8, John-street, Adelphi, W.C.

LOAN.—25*l.* REQUIRED, to complete lucrative Contract. Ample security and references, with guarantee of repayment of 30*l.* in a fortnight.—Address, Mr. STANHOPE, 34, Judd-street, W.C.

PARIS EXHIBITION.
The FINE ARTS GALLERIES are to be covered with
COCOA-NUT FIBRE MATTING,
of a New Design, specially Manufactured by
TRELOAR & SONS,
69, LUDGATE HILL.
TRELOAR'S CATALOGUE OF ALL THE BEST FLOOR COVERINGS POST FREE UPON APPLICATION.